MIMS III: REPORT: Strabology and COMMENT on the 38th Meeting of the American Association for Pediatric Ophthalmology & Strabismus, San Antonio, Texas 2012

*** ORIGINAL EVIDENCE-BASED SCIENTIFIC ARTICLES ***

KHAN: An Analysis of 5 Duane’s Retraction Syndrome Patients with Preoperative Abnormal Face Turn Reversal and/or Worsening after Standard Horizontal Eye Muscle Surgery

LARIA, SHOKIDA, TATARUCHUCK, PIÑERO and X. GONZALEZ: New Diplopic Restrictive Strabismus as a Sequela after Conjunctival Surgery for Conjunctival Lesions: A Series of 3 Cases, Management and Outcome

ARNOLD RW, ARNOLD AW, EBY and ALESHIRE: Lay Person Slit Lamp Detection of Iritis in Absence of an Eye M.D.: Test of a Portable Model of Cells and Flare

*** CASE REPORT With Management and Outcome ***

BAGHERI, TAVAKOLI and RAFAATI: Diplopic Mechanical Restrictive Strabismus due to Orbital Wall Fracture and Medial Rectus Muscle Entrapment After Endoscopic Dacryocystorhinostomy, with Optic Nerve Deficit

LEAD EDITORIAL: Restrictive (Mechanical) Strabismus: An Epidemic? DNA or Not; Twins Faces, Texas, DRS, Iritis

HYDE PARK EDITORIAL: Conscience and Consciousness
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“... the belief that one’s view of reality is the only reality is the most dangerous of all delusions ...”-Watzlawick, 1976

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Correspondence


To: James L. Mims III, M.D.
From: Judy Robinson, CO

QUESTION: The other day I heard on a TV financial channel a person talking about being to the Louvre and how he had been there. He was taking some photographs and was told, not so gently, to put his camera away as picture taking was not allowed. When he asked why, the guard said it was disrespectful and then followed him around to be sure he didn’t take any more. Presuming you took the photos in your report, we are even more impressed.

In Reply From: James L. Mims III, M.D.
To: Judy Robinson, CO

They didn’t bother me or my companion in the Louvre. We used small cameras and no flash. We weren’t the only ones taking photos. Yes, I took over 100 photos of the paintings in the Louvre. We were nearly worshipfully respectful and maybe the guards sensed that. Also, all art museums won’t allow photos in the touring shows. Maybe that was the problem for this fellow you report.

Ed Note: We commented that the Mona Lisa’s smile slightly suggested an ipsilateral 7th N. Palsy too.

B.J. Kushner reminded us in San Antonio that’s a Moebius Syndrome... -per

Meeting Announcements

THIS Coming WEEK: Tuesday 26 June - Friday 29 June, 2012

Toronto, Ontario, Canada
Quadrennial Meeting of the International Orthoptic Association. SEE AD inside front cover, on page 75

This FALL:

Milan, Italy September 7-9, 2012. 2nd World Congress of Paediatric Ophthalmology and Strabismus.

Contact: www.wcpos.org

Shanghai, China October 14-16, 2012. 3rd International ROP Congress. http://rop2012.org Contact: Lisa Erbring 215-590-4594 or Graham Quinn, Chairman of the Scientific Committee

Contact Email: quinn@email.chop.edu


Contact Email: stacy.lassman@gmail.com

NEXT YEAR (2014):


Contact www.isa2014.jp
EDITORIAL: Restrictive (mechanical) Strabismus: an epidemic? DNA or Not, TWINS FACES, Texas, DRS, Iritis Monitoring

Reminder: It’s not too late to arrange to go, next week, to the quadrennial meeting of the IOA in Toronto Canada (Tuesday JUNE 26 - Friday JUNE 29). See the advertisement on page 75 inside the front cover, website for more info.

Strabology: Restrictive (mechanical) Strabismus:
In the last three issues of this publication, there has been almost an epidemic of reports of cases on this subject; primarily how to fix those very complex, severe and difficult cases - a total of 5 reports on a total of 22 plus cases!


5. Romano PE. Stage III Intraoperative Adjustment (IOA) of eye muscle surgery (under general anesthesia) for neuromuscular and mechanical (restrictive) incomitant strabismus: Report of results in a series: Outcomes in 20 eye muscle surgeries in twelve patients.. *Binocul Vis Strabolog Q Simms Romano* 2012; 27:46-50


After we had received the first four of them, it did make me go back and look at my prior work on the subject that nobody had referenced and realize that it had only been published in the transactions of the meeting that I first presented it at. Never submitted it further. I had retired from academic medicine. I never was a very good salesman and didn’t understand that you must be if want anyone to accept or adopt your ideas or advances. Like Kelman. Or better yet, Parks, who invented that new and absolutely sure marketing thing, “pediatric ophthalmology”!
So we published it here in the first issue of this year, especially after we had received for consideration a couple more similar papers.....

That’s another dozen cases in all, for which we had performed 20 surgeries. Then the last two papers added another four cases.

With that addition of two more reports on restrictive strabismus published in this issue, we reviewed these papers for the etiology of the strabismus....

They were divided between those that were originally severe cranial nerve palsies which had not adequately responded to more conventional eye muscle surgeries (and mechanical type residual deviations) and those that were the sequelae or complications of prior ophthalmic surgery not pertaining to the eye muscles or ocular motility per se...

We can’t do much to avoid or prevent the first group but we would call upon our colleagues to help us avoid the second group.... The report in this issue, in the above reference list number 6 offers a number of suggestions which they used to correct both the secondary strabismus and to avoid it in the first place....

Editorial Followup: DNA or not; More Epigenetic Medical Problems:

More on epigenetics from your financial newspaper including the recognition as we proposed in the last issue of \textit{BV&SQ} that school myopia is an epigenetic, not solely a genetic, disease:

Then, SOME VERY SERIOUS REASONS FOR EVERYBODY TO AVOID STRESS on themselves and giving it to others...; IT SHORTENS YOUR TELOMERES! (I.e., your life).

From our favorite Medical “journal” \textit{The Wall Street Journal} Saturday/Sunday May 12-13, 2012 by Matt Ridley. \textbf{How Dickensian Childhoods Leave Genetic Scars.} “Being maltreated as a child can perhaps affect you for life. It now seems the harm might reach into your very DNA. Two recently published studies found evidence of changes to the genetic material in people with experience of maltreatment. These are the tip of an iceberg of discoveries in the still largely mysterious field of ‘epigenetic’ epidemiology - the alteration of gene expression in ways that affect later health. ... genes aren’t supposed to change, so you can pass them on to generations untainted by your own mistakes. It now seems they can at least acquire marks of experience during life, affecting how much they are ‘expressed’... shorter telomeres in children who stayed in Bucharest orphanages, compared with those in foster families. The Duke scientists have measured the effect of exposure to bullying, beating or domestic violence between the mother and her partner on telomere length between the ages of 5 and 10 ... On average, the telomeres did shrink faster in those that experiences violence than in other children. ... the loss of a parent or maltreatment as a child results in greater ‘methylation’ of some spots near a gene tied to stress response in adulthood. Methylation, the addition of a methyl group of atoms to one DNA ‘letter’, [which occurs throughout life -ed] tends to reduce the activity of nearby genes. ... genetic determinism is not necessarily a life sentence, as those who wear glasses for shortsightedness [EdBOLD] or take a growth
hormone for growth problems can attest. The same will almost certainly be true for epigenetic determinism: Understanding the mechanism should bring forward possible cures.”

More examples: From my personal experience and exposure to auto racing: So many children seem to enjoy the same sort of success racing cars that their fathers did, it seems. And a lot of that talent just has to be genetic. My talent in that area was totally natural. I loved it from the start and was pretty darn good at, winning my very first race with ease, and then winning more and several championships. Today’s champs started racing go karts when they are three year olds, but my first exposure was in the spring of my freshman year in medical school at the age of 21. Paul Newman was 46 when he started his racing career. But so many seem to have as much as talent as their fathers did even though you only get half your genetic material from a father. I think epigenetics is the answer to this inherited ability.

Sit down for this next example I propose. After watching a variety of pathologic psychos try to kill their way to world domination, I am sure that is an organic brain disease, but an ACQUIRED one, but so strong, it is as if their genetics as human beings have radically changed. And they cannot in anyway ever recognize or admit to the wrongfulness of their actions. (Is right and wrong only epigenetic? See Hype Park 138). You don’t suppose those changes are also epigenetic, do you? That might explain their total acquired inhumanity...

Kids do tend to follow their parents into life and many seem to enjoy success like just only one of their parents did, and in many occupations which do require some special talent or ability...

Of course we never hear much about the ones who don’t repeat one of their parents successes... but some of the extraordinary talent passed on from one parent looks like a good example of something more than simple genetics, like epigenetics. I think you often see that also in athletic or musical endeavors, especially female singers...

Epigenetics Far Out: The world is changing and radically, and as severely here in the old USA as anywhere. It is moving so far away from the values we grew up with. I think the epigenetic input in childhood must be and is very, very different today. It’s as if no one under about 40 has any of the needs I learned to live with and for. But isn’t that true for every succeeding generation? It is disarming in so many ways. And we disarmed our parents. What our parents and society expected of me behavior wise when I grew up is totally different today.... “Pay-Back” time?

Epigenetics “rules” your longevity through stress so be good to those around you. And the single most important “rule” about how to influence others around you is to “set a good example”. Too bad so few in government seem to understand that. Their rule is instead “do as I say, not as I do”.

Followup on The Mona Lisa: check Correspondence on preceding page 79.
This was from the AMA daily bulletin about a month ago....

This was good news for me as I have always been a coffee-holic, and drink a pot or a quart or two of the stuff everyday. It helps me to manage my bipolar depression, more so since I have been on those depressing beta blockers for a decade now for my arrhythmias, (and even my new pacemaker doesn’t relieve me of that burden at all). I become a beta blocker zombie if I don’t, and especially later in the working day... I am not sure what a lethal dose is, but I do overdose not infrequently or occasionally and an over caffeinated brain is no fun and no work either. Nor has it produced any Superman or Arnold Shwarznegger type changes in my muscles carefully taken under conditions as identical as possible with regard to most aspects that would show up in a picture.

The identical twins with this sort of real comparison, seldom looked identical in the face. To my eye one of each pair was seemingly always a little better looking and the other less so.

This was especially true for the young identical twin ladies on the cover of that issue, which was the only photo pairing in which one could be sure there no parallax problems in the pair photography as they are right together in this picture (top next page). (All the other pictures of pairs are two separate photos with no obvious fixation of camera/subject distance)

They (the cover pair) do look very identical but not quite. Now the left hand one may be a tad closer to the camera, but not much... bur her face is larger, fuller than that of the right hand twin. But there is a shape difference too. Put a ruler on the eyes and the left one has a full mm wider PD or IPD than the right one! Hmmm.
I was also able to convince myself that the left twin had slightly larger head width, nasal bridge, nasal tip and lips and chin and that it wasn’t just a matter of her possibly being perhaps a little closer to the camera than the right twin.

But National Geographic had given us lots of pictures of identical twin pairs to look at a few samples of which are on the following pages, and after perusing them, I was further able to confirm my hypothesis that the facial appearance difference between them was in each case a matter of the thickness of the parasagittal “slice” of the face. (See next page)
The four pair of identical twins below are definitely not identical in facies and the most noticeable difference is in the eye. But the relative widths of the parasagittal vertical slice also dictates a lot of the differences between the twins and that may dictate the eye differences, but in different ways than that in the top pair on this page.

Very pretty, and pretty convincing, no?. One of the best of the NG collection to back up my hypothesis.

The palpebral fissures on the right twin are smaller and vertically narrower than on the left twin, as if her wider nasal bridge did not leave as much room for the eyes as for the twin on the left with the narrower nasal bridge and “bigger” eyes...
Here’s another quartet of NG identical twins with the same range of width differences:

There is in embrogenesis a time when these features arise from each of the two sides of the embryo, much like the limbs do, and fuse in the midline to form the face of the embryo. This sagittal line in the middle of the face is also in Tessier’s established and accepted classification of boney clefts of the human head, as cleft # 14, the last of them, counting them as he does from the side of the head toward the midline.

This occurs very early in fetal life, like about when mom finally is pretty sure she has missed a period and starts to suspect she is pregnant. Since these are identical twins in the same womb, finding a reason for such differences in identical twins sounds nigh to impossible but it can make a significant difference in the appearance of the face. Here comes that new word “like” again.

And looking again when it occurs, a slant or a different slant of the palpebral fissures is a significant, easily noted difference in the twins.

In each of these pairs it is too easy to find one face more attractive than the other. We leave that to the geneticists to worry about, but they can add that to their some day “wish list”. In the meantime if you have to deal with twins, this sort of careful photography and analysis might help you to learn how to tell them apart.
In this Issue

Texas!


Thank you, thank you, thank you Jim for playing local host in San Antonio for our annual meeting!

And thank you, thank you, thank you for another huge detailed report on the strabology presentations there, and your comments on them. We don’t know how you do it. It is such a wonderful piece of work, and you seem to have references or personal experience or both on every topic. Your immense and documented work for all this time are so appreciated.

Khan AO. An Analysis of 5 Duane’s Retraction Syndrome Patients with Preoperative Abnormal Face Turn Reversal and/or Worsening after Standard Horizontal Eye Muscle Surgery. Binocul Vis Strabolog Q Simms Romano’s 2012: 27 (2) 108-112.


These last two are all cases of compound monocular binocular ocular misalignment. How’s that for a term describing an alignment problem primarily in the movement and/or absolute position of one eye, but this contributes to a binocular misalignment and both problems need remediation but together. That is why it is so and most difficult to determine exactly what to do and especially how much to do, to get the best binocular alignment for the patient....

Our results from our experience 25 years ago as finally published for indexing in the last issue here are better than those in the aforementioned group of papers on “restrictive strabismus”. And all the principles of our IOA III system are confirmed still valid in the most recently published papers using our IOA techniques (See article proper in last issue for those references).


The focus here is vast: how do you take care of patients in remote locations who need regular medical monitoring? How equipment dependent is the monitoring needed? What is more important: the equipment or who mans the equipment? These authors seek a solution to iritis monitoring!

See you again in the fall -per
Strabology Report & COMMENT on the 38th Annual Meeting of the American Association for Pediatric Ophthalmology and Strabology

Grand Hyatt Hotel, San Antonio, Texas, March 24-28, 2012

Meeting Reported by: James L. Mims III, M.D.
Local Resident, Native, Host and Reporter

Scientific Program Chair: Stephen P. Christiansen, M.D.
President: Steven E. Rubin, M.D.
Scientific Meeting Coordinator: Maria A. Schweers, CO

(EdNote: Author and resident host, Mims, Below, also, as usual, has sent a batch of his neat superb photos. This year we are able to radically and randomly distribute them individually throughout the text, [relieved of old serious costs of color by the web and by ink jet printing] so it will be harder to miss who you missed. -or important comments by Mims on various contributions. This is finally sort of a “Facebook” for AAPOS meetings, which the editor actually started to do about 20 years ago when AAPOS membership was growing too fast to keep up, but we never got it off the ground (too bad! but I was too busy and old! to do a Mark Z.). The larger, full name tags AAPOS adopted this year help ID ing pics. Maybe they could make them even more legible next year...) (Editorial comments from here on ....are by the author (Mims) and are in italics.) -PER, ed.

Remember the Alamo!

My mother always told me to thank the host as I was leaving a party, and, following her sage advice I want to say THANK YOU, AAPOS; I had a really nice time at your party! Thank you especially Jennifer Hull and Rebekka Stout, AAO co-ordinators, Scientific Program Chair Stephen P. Christiansen, MD and Executive Vice President Christie L. Morse, MD. Because you produced a flawless meeting, I was able to push the envelope (gently) and have a really great time. If the meeting had been anything but flawless, some of my antics would have come off as merely stupid. More on live dog surgery (live surgeon, mechanical dog) and the exhibit of the first textbooks of strabismus surgery later. After listing the new officers and mentioning the named lectures, this report will detail exciting and genuinely new basic science understanding of common observations in Pediatric strabismus. After that we shall continue our tradition of grouping summaries of the scientific papers, posters, and workshops pertaining to strabismus and strabology

New Officers

The new President of AAPOS, starting July 1, 2012,
... will be K. David Epley, MD. The new Vice-President will be Sharon F. Freedman, MD. The new Vice-President Elect will be Sherwin Isenberg, M.D. Robert E. Wiggins, Jr. MD continues as the Secretary-Treasurer. Stephen P. Christiansen, MD will continue as the Secretary for Program and the Scientific Program Committee Chair. Christie L. Morse MD continues as our Executive Vice President. Previous Directors-at-Large who will remain in their positions include Mary Louise Z. Collins MD and R. Michael Siatkowski, MD. The one new Director-At-Large is Derek T. Sprunger, MD.

**Costenbader and Knapp Lectures**

The Costenbader Lecture was given by ex AAPOS President Michael X. Repka MD. He went beyond the title, “Strabismus Among Aged Medicare Beneficiaries”, to point out that although up to 6% of Medicare beneficiaries have some form of strabismus, only a fraction of one percent receive strabismus surgery each year. [Is it the low reimbursement of the Medicare Fee Schedule for strabismus surgery, or is that old folks don’t care that much?] {ed note: the RV disappears with age for both surgeon and patient!}

Host City San Antonio’s crown jewel: The Riverwalk; runs right next to our Hyatt hotel
The 2012 Knapp lecture, “The Other Side of Strabismus”, was given by John J. Sloper, FRCOphth, a clinician who was the first to describe changes in the layers of the Lateral Geniculate Nucleus corresponding to the visually deprived eye (atrophy). More recently, he documented deficient hand-eye co-ordination in children with amblyopia. He has found defects in the brain corresponding to the presumably normal fellow (“non-amblyopic”) eye as well.

Risk Factors for Wrong Site or Wrong Muscle: Errors in Strabismus Surgery

The program committee sagaciously chose a study (survey) of 1103 strabismus surgeons, of whom 173 (33%) self-reported having operated on the wrong eye or the wrong muscle at some time in their careers. The rate of this kind of error was 1 in 2506 surgeries. Surgeons performing fewer than the median 1500 surgeries had an error rate 5.9 times higher. Running more than one operating room was error-prone ($p = 0.02$). In discussion from the floor it was emphasized that marking on the face is not required to reduce errors of this type to zero if a formal “time out” is observed in the O.R. prior to the start of the surgery, with empowering of all members of the operating team to speak up if they suspect an impending error. [I personally have never experienced one such error in over 5000 surgeries, and the Methodist Hospital System in San Antonio has written into its bylaws that there shall be no requirement for marking the face of children who are to undergo strabismus surgery. A colleague in another city has described losing a patient who had X’s on written on both sides of the face in the pre-op holding area for a bilateral medial rectus recession. This was the 4th case of the day, and fearful parents “freaked out” and left the hospital.](Paper 2 at 2012 AAPOS, “Human Error in Strabismus Surgery” by Tina Rutar MD, Elizabeth Shen BA, Travis C Porco PhD MPH, all of UCSF.)

Contracture as an Explanation of Some Clinical Observations in Pediatric Strabology

Thirty-five years ago I asked Marshall Parks why there was no head tilt in primary overaction of the Inferior Oblique (Primary OAIO), and he replied that he did not know. Logically if the IO is pulling too hard (as it would be if hypertrophied and/or chronically hyper-innervated), there should be a head tilt to the opposite side. In private discussions and in the workshop entitled “Ocular Motor Plasticity in Strabismus” Burton Kushner MD contended that if the primarily overacting IO were merely
contractured, then there would be no head tilt. In this ongoing debate, Mims had to admit that while he was certain that primarily overacting inferior oblique muscles in very young children with primary OAIO were larger in diameter than secondarily overacting inferior oblique muscles in adults with superior oblique palsy, he really didn’t know if adults in general have inferior oblique muscles that are smaller than those in young children. All agree that primarily overacting IO have not been studied by Demer’s MRI techniques, because little kids won’t cooperate well enough. Meanwhile, another audience member, David Guyton MD reminded everyone that the extorsion, which is known to precede clinical primary OAIO, would elevate the MR insertion enough to produce the clinical picture of OAIO.

Further possibilities of the importance of contracture were raised by Mims. First, he has observed that about 50% of young children receiving a 9 mm recession of one LR for X(T) will seem to be undercorrected if measured at 3 to 8 weeks post-op, but that most of these will demonstrate orthotropia and orthophoria or truly small exophorias at 4 months post-op. Mims asked Linda McLoon PhD if her studies of muscle metabolic activity early after strabismus surgery would support the hypothesis that the operated lateral rectus muscle underwent full contracture weeks earlier than the unoperated antagonist medial rectus muscle. Mims called this the “stirring up the juices” hypothesis. McLoon replied that, yes, the operated muscle had much more reorganizational activity (is much more metabolically active) than the unoperated antagonist in the early post-operative period.

Kushner and Mims had already agreed that another common observation could be explained by this difference in rate of contracture post-operatively between the operated agonist and the unoperated antagonist. This observation is that among a series of infantile esotropes all receiving a bilateral medial rectus recession according to a statistically rigorous dose-response curve based on results at 6 week post-op, the infants with the larger angles will tend to have a recurrent ET by 4 months post-op, even though they were
orthotropic at 6 weeks post-op. (Tran HM, Mims III JL, Wood RC. A new dose-response curve for bilateral medial rectus recessions for infantile esotropia. *J AAPOS* 2002; 6:112-119.) This observation, also, could be explained by the longer LR in the infants with larger ET angles pre-op, which would take longer to undergo full contracture than the corresponding recessed medial rectus muscles.

[In this publication, BVS&Q, we have previously discussed how progression of the size of an unoperated esotropia from age 5 mos to age 12 mos, could be explained by progressive contracture of the medial rectus muscles. (Mims III JL. Further implications of probable changes in medial rectus innervation after surgery for infantile esotropia. *Binocul Vis Strabismus Q* 2009; 24(No.4):228-232.) If, after all, a muscle reorganizes itself internally to achieve a normal linear density of sarcomeres according to the average length of that muscle in a 24-hour period, then the chronically hyper-innervated MR is shortened until a steady state is reached between the hyper-innervation and the shortened sarcomeres (down their length-tension curve). When the contractured muscle then approaches a more nearly normal linear density of sarcomeres, then it will once again pull harder for a given level of hyperinnervation, and produce an even larger angle of esotropia. This neatly explains why the angle of ET grows larger over time in most babies.]

In this same workshop, Vallabh Das PhD reported recordings from the motor cortex in monkeys with sensory induced esotropia. (He uses opaque contact lenses and alternated them daily in the first few months of life, and reliably induces esotropia.) He reports that A & V patterns can be explained entirely by his recordings in the motor cortex. (David Stager Jr MD made the workshop even more interesting by giving a pre- and post-workshop quiz for the audience with the audience responding with remote-control devices (just like the adult cataract surgeons do).

In the body of the workshop, Linda McLoon emphasized variability and constant remodeling and Stephen Christiansen MD emphasized neural gain and CNS plasticity.
Can the Fascicles of Extraocular Muscles Easily Side Over One and Another? (and why it matters)

Extending their blockbuster revelations last year of separate innervation to the superior and inferior halves (roughly) of medial rectus muscles, Robert A. Clark MD and Joseph L. Demer MD PhD reported that their MRI studies suggested differential compartmental contractility of the medial rectus in normals in supraduction but not infraduction. They hypothesize that this contributes to the torsional stability of the eye as it looks upward. In the formally presented discussion of this paper, Linda McLoon PhD presented 4 major points that would refute this paper’s findings. In panel discussion (and in my 30-minute discussion with this author later), Clark refuted all 4 of her points.

McLoon
1. Histological study reveals stout interconnections between muscle fascicles.
2. On upgaze, the upper border of the MR is shorter and the lower border is longer, thus explaining Clark’s findings as merely passive changes.
3. Classical EMG recordings reveal no changes on upgaze.
4. The 3rd nerve nucleus is incompatible with differential contractility of the upper and lower halves of the MR.

Clark
1. Biomechanical study of fresh muscles Reveals easy slippage.*
2. Both upper and lower borders of the MR are longer on upgaze, increased contractility is seen only in the upper half of the MR
3. Recordings have not been made at the Upper half vs. the lower half.
4. No, it isn’t.

* a Best-of-Show Blue Ribbon Award Winning Poster: “Mechanical Study of Compartmentalization in Passive Bovine Extraocular Muscles (EOMs). By Andrew Shin MS, Lawrence Yoo PhD, and Joseph L. Demer MD PhD.

[Stay tuned for the future resolution of this Battle of the Titans of EOM physiology and histology.]
Papers & Posters That Will Impact My Practice of Strabismus Surgery

Deepak Mangla MS, John W Simon MD, and Jitka Zobal-Ratner MD compared two groups of 17 patients treated for consecutive exotropia. In this presentation, Mangla et al compared two groups of 17 such patients with similar preoperative deviations. Postoperative deviations were 11.4 prism diopters in the advancement group and 11.9 prism diopters in the resection group, and a somewhat higher proportion of the advancement group achieved binocular re-alignment within 10 diopters of orthotropia (65% vs 47% for resection).

I shall continue my current practices. Also, I shall continue to have the usual concerns about eliminating concurrent IO or SO overaction. Note: I no longer perform bilateral SO tenotomies for lambda pattern consecutive exotropia because it tends to produce esotropia in down gaze. Instead, I perform bilateral Rosenbaum posterior tenectomies of the SO tendon at its insertion, as described in the Rosenbaum Santiago textbook, leaving only the anterior 1 mm of the SO tendon intact. Usually, to prevent worsening or unleashing DVD, I will simultaneously recess both SR 10 mm with 3 mm of nasal transposition. I probably couldn’t do this routinely were it not for my private duty scrub nurse, Susan Seekatz, who has been kind enough to work with me for 28 years.]

Three other posters verified previous prejudices. For many years, for angles of less than 30 prism diopters, I have been content with a 9 mm recession of the ipsilateral LR for patients with organic amblyopia, and recessions of 6 mm with PFS [myopexy] for esotropes with dense and intractable amblyopia. Luisa M Hopker MD and David R Weakley MD compared 42 patients with sensory strabismus who received a one-muscle recession with 41 who received recess-resect. Of these 83, 36 had sensory ET and 47/83 had sensory XT. With a mean age of 65 months and a mean follow-up of 35 months, success (within 10 PD) was achieved in 74% of one-muscle procedures and 54% of recess-resection procedures. [Hopker
and Weakley did not add the PFS [myopexy] to the MR recession as originally suggested by Malcolm Mazow MD, but I am convinced that it is important to add the PFS [myopexy] in the presence of eccentric fixation.

Another prejudice verified was the importance of removal of the scleral buckle in cases of strabismus appearing after retinal detachment surgery. Jee Ho Chang MD PhD, Amy K Hutchinson MD, Monica Zhang, and Scott R. Lambert MD found a “statistically significant” difference (62.5% success with buckle removal and only 11.1% success without buckle removal, p < 0.05).

Yet another prejudice [Ednote: Author Mims likes this word “prejudice” and uses it a lot but he is only being pre-emptive against counter attacks because he doesn’t really mean he is what the dictionary says about this term: “1. An unfavorable opinion or feeling formed beforehand... without knowledge, thought or reason. 2. Any pre-conceived opinion... 3.Unreasonable feelings, opinions, or attitudes, esp. of a hostile nature...” -PER] verified was ignoring most verticals when planning strabismus surgery for primary intermittent exotropia. This was verified by Michael C Struck MD and Timothy J. Daley MD, who reviewed the charts of 21 consecutive patients with 5 or more prism diopters of hypertropia in the setting of intermittent exotropia. At 6 months post-op, 9/11 patients with hypertropia who underwent horizontal muscle surgery alone were binocularly “aligned” (82%), whereas only 3/10 of patients with combined vertical surgery were “successful” (30%). Five of the ten receiving simultaneous vertical and horizontal surgery had an “overcorrection” of the vertical deviation.

One of my prejudices in regard to the ineffectiveness of a certain procedure was also verified. Preeti A Patil DNB, Mahmoud El Sahn, Salma Khayali, Shira L Robbins MD, and David B. Granet MD transposed the lateral halves of the vertical rectus muscles combined with Scott Foster lateral fixation sutures in 4 patients with sixth Cranial Nerve palsy, and had large average 15 prism diopters residual deviations.
I am aware of three patients who had this procedure by excellent surgeons elsewhere who also had gross undercorrections. Personally, I really like David Coats MD et al (who published a nice diagram of this procedure in BV&SQ: Coats DK, Brady-McCreery, Paysse EA: Split rectus muscle modified Foster augmented partial transposition procedure for paralytic strabismus. Binocul Vis Strabismus Q 2001; 16:281-284 and David Granet MD, the senior author of this poster, but I simply think this procedure is inadequately effective.]

[EdNote: we again (sorry...) recommend for all these surgeons and patients our stage III (endoperative) intraoperative adjustment of eye muscle surgery, guided by the surgically achieved binocular re-alignment, see Lead Editorial this issue, pages 80-87 and the prior first issue of this publication for 2012, for our specific guidelines, article on pages 46-50]

Ahmed Gomaa MD of Cairo joined Monte Del Monte MD in presenting 5 patients with 3rd N palsy and aberrant regeneration such that the blepharoptosis resolved in adduction. They performed a large LR recession and MR resection in the other eye with “good” results. [This is not the first time this has been reported in this rare type of patient. I have seen and operated, with similar success, one case in 34 years of practice.]

Niraj R Nathan and Sean P Donahue MD PhD managed 5 cases of internuclear ophthalmoplegia with a nasal Jensen procedure and large recessions of the lateral rectus muscles and were “happy” with the results.

Third Nerve Palsy and INO (Internuclear ophthalmoplegia) Surgical Treatments

Linda R. Dagi MD and David G. Hunter MD, PhD performed split nasal transposition of the lateral rectus to the insertion of the medial rectus with postop’ adjustment in 3 children, two with unilateral and one with bilateral complete 3rd Nerve palsies and produced no new vertical deviations while improving the XT from a median of 35 ET pre-operatively (range, 30-135) to a post-operative range 0 to 10ET.

Superior Oblique Palsy

Elias Traboulsi MD, Reecha Sachdeva MD, Paul Rychwalski MD, and Andreas
Marcotty MD compared results of surgical treatment of SOP in 42 who had undergone recession of the IO vs 45 receiving myectomy of the IO. Those patients receiving myectomy had less post-op HT in primary gaze (p = 0.002) if the deviation was less than 20 HT in the primary position pre-op, but surgery on the IO alone was generally insufficient for deviations above 20HT.

[Note: I will not change to myectomies as described, having seen three cases of ET in up gaze after myectomies. Instead, I shall continue to perform a procedure originally described at a Texas Society for Pediatric Ophthalmology by Monte Stavis MD 20 years ago. This includes a triangular myectomy of the posterior insertional fibers, and attachment of the anterior insertional fibers 5 mm posterior to the lateral end of the insertion of the inferior rectus. This rarely produces ET in up gaze and in 2 cases I have retrieved the IO and advanced it to eliminate an ET in up gaze. I have performed this procedure over 200 times, usually for primary OAIO, but occasionally for SOP.]

Reza Nabie MD, Minoo Azadeh, and Dima Andalib MD performed “graded” recessions of the IO in 32 patients with unilateral SOP with primary position deviations of up to 25 HT and reported good results for patients with deviations less that 20 HT. Their success rate was 89% for deviations of 16-20 HT, but only 50% for deviations of 21 – 25 HT. [Benefits of grading vs performing the same procedure in every case are not proven in this type of study.]

Karen Hendler MD, Federico G Velez MD, Arthur Rosenbaum MD, Joseph L Demer MD PhD, Guillermo Velez MD, and Stacy L Pineles MD combined their experience in surgical treatment of laterally incomitant hypertropias, with 25 patients receiving recessions of the IO and 21 receiving small recessions of the IR. They reported 8% overcorrections in central gaze in the IO group and 14% overcorrections in the IR group. Significantly, no patient in the IO group was overcorrected in down gaze, but 19 % [%] were overcorrected in down gaze in the IR group.

[I sincerely hope all of these authors were measuring carefully in 9 cardinal positions and performing the Intraoperative 3-Step Test, or at least the Plager Test before deciding to perform a weakening procedure on the IO. (Mims III JL. The triple forced duction test(s) for the diagnosis and treatment of superior oblique palsy. Binocul Vis Strabismus Q 2003; 18(1):15-24.)]
The Effect of Medial vs Lateral Rectus Surgery on Distance-Near Incomitance

Steve Archer MD has been dubbed the statistical conscience of AAPOS, a title he well deserves. His definitive paper on this, “The effect of medial versus lateral rectus muscle surgery on distance-near incomitance”. *J AAPOS* 2009; 13:20-26, should have been the last word on this subject: When you recess or resect the lateral rectus, you do not get more effect on the distance deviation than the near deviation, and when you recess or resect the medial rectus, you do not get more effect on the near deviation than the distance deviation, in either case, unless that is what the patient happens to need from your surgery. His analysis was based on over 600 patients.

The 23 patients Reported and studied here by A Pauls Grigorian MD, Brita Deacon MD, Scott Lowery MD, Katherine J Fray CO, Shawn L Brown BS CO COMT and Paul H Phillips MD added little, except that they looked at results unusually early, at only one week post-op.

[One example is that if you get a recurrent high AC/A ET years after a bilateral medial rectus recession, the best surgery is a unilateral LR resection of 7.5 mm usually, as originally suggested by Burton Kushner MD at the 2004 AAPOS meeting, and confirmed in large series by Nelson et al in 2006. Thus unilateral LR resection is much better than doing anything else to a medial rectus in recurrent high ACA ET, such as marginal myotomies (the 70’s, proven not to be a good idea by von Noorden), posterior fixation sutures (the 80’s, tough to deal with if you get a consecutive XT later), or re-recessions (the 90’s, at least 27% late consecutive XT in children as published by the Stager group in *J AAPOS*.) Another good example is recurrent XT with a larger deviation at distance than at near after previous bilateral lateral rectus resections of 6 or more mm. Resection of one MR 5 mm works really well. (Mims III JL. Outcome of 5 mm resection of one medial rectus muscle for recurrent exotropia. *Binocul Vis Strabismus Q* 2003; 18(3):143-150).]

In a similar vein, Zia Chaudhuri MS FRCS(Glasg) and Joseph L Demer MD PhD found that MR recession was as effective as LR resection in divergence paralysis esotropia (DPE). 6 patients with DPE had MRI and all demonstrated LR sag as the cause of the strabismus. This is due to a thinning and atrophy of the membrane connecting the LR and the SR as described in detail by Demer last year. They found, however, that recession of the MR, “physiological antagonist of the sagging LR, provided binocular
single vision without convergence insufficiency at near”, and was more convenient for later intraoperative adjustment under topical anesthesia than was LR resection.

Winner of the 2012 “I told you so” Award

Kirsta L. Schoeff DO, Zia Chaudhuri FRCS MS, and Joseph L Demer MD PhD measured horizontal rectus EOM size and contractility in concomitant esotropia and found that both the MR and the LR had supernormal size and contractility. Greater MR contractility could either reflect greater MR neural drive in esotropia or merely reflect the larger horizontal ductions in the MRI scanner enabled by the strabismus. LR function was not reduced in size or function in these patients with concomitant esotropia. [Told you so? Well, maybe this is compatible with the notion that medial rectus muscles in esotropia are hyperinnervated until we do something to make the eyes straight, elicit FUSION, and normalize the innervation of the medial rectus. (Mims III JL, Miller AM, Schoofield J. The exoshift under anesthesia correlates with probable changes in medial rectus innervation after surgery for infantile esotropia. Binocul Vis Strabismus Q 2008; 23(4):215-226.)]

Unilateral aphakia and Strabismus

Erick D. Bothun MD, Julie Cleveland MSPH, Michael J Lynn MS, Stephen P Christiansen MD, Deborah K Vanderveen MD, Saniel E Neely MD, Stacey J Kruger MD, and Scott Lambert MD participated in a study of 114 infants operated for unilateral congenital cataract with random assignment to IOL implantation or contact lenses for the optical treatment of unilateral aphakia. Strabismus
developed in the first year of follow-up among 38 (67%) of the pseudophakic infants and 42 (75%) of the infants treated with contact lenses. (p=0.59) The younger cohort at the time of surgery developed less strabismus (29 of 50, 58%) than the older cohort (51 of 64, 80%)(p<0.01).

Prematurity and Reoperations

Lani T. Hoang MD, Carolyn Wu MD, and Deborah K VanderVeen MD studied strabismus surgical results in 24 patients born prematurely. Mean gestational age/birthweight was 29 weeks/1037 grams in the “success” group (56% of the 24) vs. 26 weeks/805 grams in the “failure” group (44% of the 24). Thus, the more premature, the greater the need for second surgeries.

Is Strabismus Surgery Worth the Cost?

Miriam Ehrenberg MD, Bharti R Nihalani MD, Christina E Cain MPH, Patrice Melvin MPH, and Linda R Dagi MD studied 733 patients undergoing strabismus surgery and assigned one of four reasonable goals to each surgery. These goals were: (1) binocular vision function with some level of stereopsis (2) restoration of eye contact (3) diplopia control, or (4) torticolis management. The politically correct term they used for these study goals was “Goal-determined, Risk-Stratified Outcomes Analysis”. One of these goals was achieved in 84% of their patients.

Kelly MacKenzie, Hayley James, Charis Au, Jo Hancox, Daniel Ezra, Gillian GW Adams MD, and Stanton Newman studied the psychological status of adults with strabismus seeking surgical correction and found that the size of the deviation was not as important as how the patient felt about having a noticeable strabismus and their expectations for improving social relationships after the strabismus was corrected. (48 patients, psychological questionnaires)
positive impact on these patients quality of life.

David A Leske MS, Sarah R Hatt DBO, Laura Liebermann, and Jonathan M Holmes MD sought to improve the adult strabismus-20 (AS-20) questionnaire and found a closer correlation with strabismus surgical successes using a Rasch-modified AS-20, due to an emphasis on the psychosocial subscale.

[However, nothing beats the $1.4 million in lifetime income loss credibly estimated resulting from UNcorrected strabismus, etc. in Beauchamp CL, Felius J, Beauchamp GR. “The economic value added (EVA) resulting from medical care of functional amblyopia, strabismus, (pathologies of binocular vision) and asthma”. Binocul Vis Strabismus Q 2010; 25(4):206-216 when you are trying to justify strabismus surgery. Thank you Cynthia, Joost, George, Paul, and Judy! [EdNote: you don’t suppose the economic difference to the patient by normalization has anything to do with their Quality of Life, per se, do you? Maybe it just makes them FEEL better! $1.4 million worth of feeling better! Maybe there just really should be a big fat full lifetime government entitlement for everyone who is NOT beautiful or good looking! Or see the wonderful Brazilian alternative in Hyde Park Editorial pages 138-152 -PER ]

Can You Save Money by Performing Unnecessary Surgery?

The answer, clearly, is yes, if in performing the first surgery of a potential 2 or 3, the total of your failure percentage plus the percentage of unnecessary surgeries (due to potential for spontaneous resolution of the problem without surgery) is smaller than the failure percentage experienced if you wait until all the patients with a reasonable potential for spontaneous resolution have resolved.

One example is unilateral recession of one LR 9 mm in children with X(T) performed at age 18 mos. The long term failure rate is 20%, when the surgery is performed at this age, but you might be operating on as many as 10% “unnecessarily”. If you were to wait until 6 years of age and perform bilateral lateral rectus recessions, you then incur 3 penalties: (1) poorer outcome in stereopsis; (2) initial cost slightly higher due to longer O.R. time and fee for two instead of one muscle surgery; and (3) a re-operation rate of 40%. (But early surgery’s 10% + 20% = < 40%).

This is a fairly well-recognized example (at least in most of Texas and in Philadelphia) of how “unnecessary” surgery can be economical and therefore in the public’s best
interest economically. This conclusion was validated by several discussions at this meeting.

A similar analysis of office probings for NLD obstruction vs. waiting to perform the initial probing under anesthesia in those few for whom the obstruction did not spontaneously resolve; by PEDIG; led to the conclusion that the early office probings cost society less, even though many infants would be probed who would have recovered later spontaneously. (Ednote: in retrospect that strikes me, in this case, as a major moral wrong, as it sounds as if it writes off all the risks, psychic trauma, inconvenience and other human costs of the unnecessary surgery and the benefits of general anesthesia. Although our current government would agree with PEDIG, since cost to them is their sole and only consideration when it comes to the practice of medicine.-PER)

Infantile Esotropia, Something to Worry About long term again, or not.

The wonderful long-term results of esotropes straight at age 14 years and still straight at age 30 years (116/117) reported by Jack Baker MD at previous AAPOS meetings was diminished by Mohamed S. Soliman MD, Alan B Richards MD, and John D Hinrichsen MD. These authors found 6 patients with previous infantile esotropia who developed diplopia between ages 13 and 33 years of age. The number of surgeries per patient ranged from 2 – 6 (mean was 4). All had experienced consecutive exotropia requiring surgery. 3 had deviations of 6 prism dipters or less, and 3 had 10 – 15 ET. As usual Kushner had reported on this flaw in the diamond previously. (Kushner BJ. Recently acquired diplopia in adults with longstanding strabismus. Arch Ophthalmol 2001; 119:1795-1801.)
Anterior Orbitotomy for “Lost” or Transected Medial Rectus Muscles

Stacey L Pineles MD, Jessica Laursen MD, Robert Goldberg MD, Joseph L Demer MD, and Federico G Velez MD tabulated the functional results of repairs by anterior orbitotomy performed in cases of MR transection or avulsion. 5 of 9 patients achieved single binocular vision in the primary position. They did not claim better functional results than other treatments, but 5 of 9 patients are really happy.

Assorted Observations in Strabismus

Michael S. Abrams MD pointed out that large loose prisms, such as those we all use in performing the alternate cover and cover-uncover tests, can fit into the clips in an adult trial frame, and will stay in place for long enough for the adult to “experience” correction.

Surgical Alternatives for Exo-Duane’s with Severe Co-contraction

Pradeep Sharma MD, Ruchi Tomer MD, Vimla Menon MS, and Rohit Saxena ME performed periosteal fixation of the lateral rectus in 6 patients and combined this with split vertical rectus lateral transpositions in 7
additional cases of exo-Duane’s. In addition to measurements in 9 cardinal positions, they measured adduction and abduction using a synoptophore, the extent of binocular single vision using a perimeter, Hertel exophthalmometry and palpebral fissure measurements at 1 week, 1 month, and 3 months post-op. They were impressed that split vertical rectus transfer improved the extent of the single binocular field, but the very small further improvement in the primary position angle made me question this. You can make the right patient with this type of problem really happy simply by extirpating the offending lateral rectus. Spectacular cases treated with extirpation of the offending lateral rectus have been presented at the Texas Society for Pediatric Ophthalmology by O.B. Jackson MD and Susan Berry MD.

Russians Secretive about their Different Strabismus Surgery Dosage

When Igor E Asnauryan PhD, Mohamad El Sada, Victoria O Balasany Mpd PhD and Erik Aznauryan of Cairo and Yasnic Vzor of Moscow presented a “mathematical model for the calculation of the horizontal parameters for horizontal strabismus surgery” everyone was initially excited, until Burton J Kushner MD in formal discussion pointed out that the computer program was proprietary (“private” and not available for his needed critical analysis) and was for only “recess-resect” procedures in which the “resection” was actually a muscle plication instead of the resection prevalent elsewhere so this presentation was Not helpful for the rest of the world and us.

Elsewhere: Rachel Bloom MD, Norman Medow MD, and Iliana B Friedman MD sent a survey to all physician members of the AAPOS and segregated results of types of surgeries performed by those practicing in the USA and those practicing outside the USA. (Interestingly, in view of the plications used in the paper cited in the previous paper, above, 97% of surgeons worldwide do resections, not plications.) When amblyopia is not severe, bilateral surgery is preferred by 87% of US surgeons, but only 70% of non-US surgeons. Worldwide, 70% do not use any adjustable sutures. Only 2% use post-op oral antibiotics worldwide. [I.V. antibiotics after anesthesia induction and prior to surgical incision is now virtually universal in the U.S.] Post-op endophthalmitis occurring at least once in a surgeon’s career was similar worldwide, about 9% of those reporting. [Thank God I’ve never had one!]

The 170 year old First Textbooks of Strabismus Surgery

The first Saturday afternoon of the meeting, in the registration hall, in special plastic display cases, Mims displayed [? HIS ORIGINAL COLLECTOR COPIES OF ?
The first monographs published with diagrams of strabismus surgery. These five works were the first published in Germany (Dieffenbach), France, Great Britain, Boston, and Richmond. They were all published in 1840 – 1842. What Fun!
(Your Reporter’s Poster:)

A Surprisingly Simple Way to Control, Remotely, Strabismus Eye Examination Lane Distance Fixation Toys that Sing and Dance (instead of barking)

Dressed in surgical scrubs, Mims performed live mechanical dog surgery to demonstrate... this, his meeting poster on how to do it yourself!

Cover test and alternate cover test measurements with good distance fixation [and control of accommodation -ed] are demanding but essential tests in the management of pediatric strabismus.** Historically, barking dog toys provided the brief moment of attention and fixation needed from the child. New mechanical toys that sing and dance could provide valuable additional seconds of attention but have proven difficult to control remotely with appropriate power from standard wall current sources.

The availability of 8X "Ultimate" very long lasting lithium batteries has changed the paradigm for the brief momentary power sources for these toys. Surprisingly, dissection exploration of the newer toys reveals that the there is a press-on, press-off switch in the limb or paw which is connected to the interior by only two small gauge wires (instead of a computer!). If these two are briefly connected (touched one to the other), the toy turns on or off, (which is ALL we need!).

Equations for direct current indicate that larger gauge wires (such as 16 or 14) have less resistance than smaller wires with little drop in voltage over the remote 6-meter distance of eye targets in a standard eye lane (and folding it up doesn't work with strabismic kids.). So we used that to extend the wires and switch from the toy to the examiner's position.

In addition to detailed photographs of the modification method in the poster, an 8 minute movie with 27 toys was also shown during poster viewing hours, demonstrating historical toys and the new toys that sing and dance and the surprisingly simple surgical technique for invading the toys and accessing the wires and connecting them to a remote-control switch. Widely available inexpensive toys that sing and dance can now be used for distance fixation devices in the pediatric strabismus exam. One toy can be easily exchanged for another; the toys can even be seasonally appropriate. Or several different or even identical toys can be displayed and alternated with separate switches.

Ednote: parting shot (Your ed’s life has been on the line medically four or five times in the last dozen years, and one of these times it will be too late, so we take our opportunities when they appear.): we had to add to Jim’s fantastic report and clever engineering the following:

**and for the surgeon, very time consuming in addition to being quite difficult, especially with some children, toddlers and infants. Dr. Mims and many others emulate or were taught by Marshall Parks to do this all by themselves and Dr. Mims has published many of the manual tricks that enable him to do this singlehanded. It is not surprising that he seldom has the time or energy to also perform the various tests for binocular vision (personal communication).

Others, like your editor, have encountered early in their careers talented and trained orthoptists, commonly females with “the right” or superior genes to deal with children, and appreciated their tremendous ability to help in the thorough and complete examination of strabismic children. In our clinical practice we found the male/female combo to work one way or the other for the most resistant children in obtaining both measurements of the deviation and binocularity.

We note this now, as with the recent conversion of strabology to pediatric
ophthalmology, it seems to have made many like Dr. Mims to have never learned about or have forgotten orthoptists, or feared them much like its inventor who worried they would compete with Eye MDs like optometrists did. But trained orthoptists are still available and are now trained to do near everything else too. But you cannot expect as expert help from someone who has not spent a lot of time in training in a strabology clinic.

If you are thinking of hiring an orthoptist, they (The International Orthoptic Association) are having their quadrennial meeting in Toronto in just a few weeks in June. (See their ad inside front cover of this issue.)

Ednote: As, unofficial local host, Dr. Mims also made up and copied for distribution during the meeting, several handouts which were also given out to all the attendees, describing the best tourist attractions and restaurants in the area around the Grand Hyatt Hotel. He even arranged the Rio Raxi night touring (see prior pages).

The next, 2013, annual AAPOS meeting will be held at the Westin Copley Place in Boston. Meeting Dates: April 3-7, 2013.

DISCLAIMER: While the reporter has endeavored to be as accurate as possible in reporting in the presentation at this meeting, the reader is strongly advised to confirm any information in this report before acting on it or applying it to patients.
An Analysis of 5 Duane’s Retraction Syndrome Patients With Preoperative Abnormal Face Turn Reversal and/or Worsening after Standard Horizontal Eye Muscle Surgery

ARIF O. KHAN, M.D.

From the Division of Pediatric Ophthalmology, King Khaled Eye Specialist Hospital, Riyadh, Saudia Arabia.

ABSTRACT: Background/Purpose: Although horizontal extraocular muscle rectus recession is an accepted treatment for abnormal face turn (AFT) in Duane’s Retraction Syndrome (DRS), in some situations it can worsen or reverse the AFT. Patients referred to the author with this complication over a 4 year period (2002-2006) were reviewed to identify potential risk factors.

Methods: Retrospective medical record review of DRS patients referred because of reversal and/or worsening of the preoperative AFT immediately after technically uncomplicated horizontal rectus eye muscle recession surgery.

Results: All five patients (5-9 years old, all girls) preoperatively had unilateral DRS (four Type I, one Type III), with significant co-contraction during attempted ipsilateral adduction, orthotropia in the preoperative AFT, normal vision in both eyes, and no other ophthalmic findings. Four patients had significant postoperative AFT reversal: three DRS Type I patients with original primary position esotropia of 20 prism diopters or less who developed postoperative primary position exotropia after large ipsilateral medial rectus recession (two bilateral, one unilateral), and one DRS Type III patient whose primary position exotropia persisted after moderate bilateral lateral rectus recessions with a posterior fixation myopexy suture to the contralateral medial rectus muscle. The fifth patient had postoperative worsening of the original AFT: she was a DRS Type I patient with original primary position esotropia of 40 prism diopters who still had significant undercorrected primary position esotropia after large bilateral medial rectus recessions.

Conclusions: The amount of ipsilateral medial rectus recession for treatment of AFT in esotropic unilateral Type I DRS should be limited if significant preoperative co-contraction is present and the degree of primary position esotropia is small; otherwise, a significant reversal of the AFT may occur. Surgical matching of the DRS eye’sduction limitation in the unaffected eye (e.g., by posterior fixation suture or large recession) can potentially lead to a compensatory face turn in the direction of the duction limitation in the context of post-operative significant primary position strabismus.
INTRODUCTION:

Duane’s Retraction Syndrome (DRS) is a form of congenital incomitant strabismus characterized by co-contraction of the medial and lateral rectus muscles in the affected eye(s) during adduction (1).

A common goal of initial strabismus surgery in unilateral DRS is reduction of the abnormal face turn (AFT) which patients often adopt to maintain binocularity (2). One accepted surgical approach is horizontal rectus muscle recession in the affected eye with or without surgery in the unaffected eye to match the duction deficient of the affected eye (3-6).

For example, in esotropic DRS Type I, medial rectus recession for the primary position esotropia can be performed in the DRS eye while a large medial rectus recession and/or placement of a posterior fixation suture can be performed in the contralateral eye to match the DRS eye’s abduction defect – this would theoretically put the contralateral eye in “fixation duress,” and promote abduction in the DRS eye (rather than adduction, the position in which co-contraction occurs). However, poor outcomes have infrequently been reported with this approach (7,8,9).

The purpose of this study is to review a series of patients with DRS who were referred because of poor outcomes after this surgical approach, in order to try to identify potential risk factors for this paradoxical outcome.

METHODS

A retrospective medical chart review was performed for five unilateral DRS patients who had uncomplicated rectus muscle recession as initial surgical treatment for a significant AFT but had undesirable results that were evident immediately post-operatively.

These patients had been referred to the author between 2002 and 2006.

RESULTS

All five patients (5-9 years old, all girls) had unilateral DRS (four esotropic Type I, one exotropic Type III), normal vision in either eye, and no significant ophthalmic findings other than the findings associated with DRS.

Preoperatively, in their affected eye all patients had obvious lid fissure narrowing and globe retraction during adduction. In addition, during adduction of the affected eye upshoots were demonstrable if the eye was slightly supraducted and downshoots were demonstrable if the eye was slightly infraducted. Otherwise, there was no vertical strabismus. All five patients were orthotropic in (at) their preoperative AFTs (Table). Surgeries were performed as planned with no intraoperative complications. Intraoperative forced ductions were positive for restriction in the affected eyes in abduction for the esotropic patients and in both abduction and adduction for the exotropic patient.

Postoperative examinations were within two weeks of the surgery. All patients were orthotropic in (at) their postoperative new AFTs. Patient data is summarized in the Table, top, next page.
TABLE: Patient Data in 5 Cases of Duane’s Retraction Syndrome after Conventional Horizontal Eye Muscle Surgery

<table>
<thead>
<tr>
<th>C</th>
<th>Age</th>
<th>Sex</th>
<th>Face Turn (side, degrees)</th>
<th>DRS Eye, Type</th>
<th>Adduction/Abduction deficit (Eye, 0 to -4)</th>
<th>Primary (Prism diopters)</th>
<th>Surgery performed (mm recession)</th>
<th>New face turn (side,) degrees</th>
<th>New Primary (prism diopters)</th>
<th>New Adduction/Abduction deficit (Eye, 0 to -4)</th>
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<tr>
<td>1</td>
<td>7, F</td>
<td>R, 10</td>
<td>R, I</td>
<td>R, -1/-4</td>
<td>ET 8</td>
<td>RMR 6</td>
<td>L 15</td>
<td>XT 30</td>
<td>R, -2/-2</td>
<td>L, 0/0</td>
</tr>
<tr>
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<td>6, F</td>
<td>L, 25</td>
<td>L, I</td>
<td>R, 0/0</td>
<td>ET 30</td>
<td>RMR 6.5, LMR 7.5</td>
<td>R 10</td>
<td>XT 20</td>
<td>R, 0/0</td>
<td>L, -1/-3</td>
</tr>
<tr>
<td>3</td>
<td>5, F</td>
<td>L, 15</td>
<td>L, I</td>
<td>R, 0/0</td>
<td>ET 10</td>
<td>RMR 5, LMR 9</td>
<td>R 15</td>
<td>XT 8</td>
<td>R, 0/0</td>
<td>L, -1/-3</td>
</tr>
<tr>
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<td>6, F</td>
<td>L, 10</td>
<td>L, I</td>
<td>R, 0/0</td>
<td>ET 40</td>
<td>RMR 6.5, LMR 7.5</td>
<td>L 25</td>
<td>ET 20</td>
<td>R, -2/-0</td>
<td>L, -2/-3</td>
</tr>
<tr>
<td>5</td>
<td>9, F</td>
<td>L, 10</td>
<td>R, III</td>
<td>R, -1/-1</td>
<td>XT 25</td>
<td>LLR 12, RLR 6, LMRpfs</td>
<td>R 15</td>
<td>XT 30</td>
<td>R, -1/-1</td>
<td>L, -4/0</td>
</tr>
</tbody>
</table>

Legend for Table:

C: Case number; DRS: Duane’s Retraction Syndrome; mm: millimeters; M: male; F: female; R: right, L: left; MR: medial rectus muscle; LR: lateral rectus muscle; pfs: posterior fixation suture [myopexy] (placed 12 mm posterior to the insertion); ET: esotropia; XT: exotropia.
DISCUSSION

The review of the accumulated data led to the following hypothesis:

The use of rectus muscle “dose-response” tables, while appropriate for the treatment of most traditional primary position strabismus, is not appropriate for the surgical management of DRS with significant co-contraction.

Patient #1 had an amount of ipsilateral medial rectus recession that may have been appropriate for a traditional (non-DRS) fusing patient with the amount of primary position esotropia that was measured in the context of an abduction deficit; however, this amount of medial rectus recession led to adduction limitation and a significant postoperative AFT in the opposite direction. This is presumably because the amount of recession in the esotropic DRS Type I eye gave a relative advantage to the ipsilateral lateral rectus muscle during the remaining co-contraction that occurred during attempted adduction of that eye. This relative mechanical advantage of the lateral rectus muscle then led to a compensatory face turn opposite to the muscle’s direction of action in order to maintain binocularity.

Similar results occurred in Patients #2 & #3, both of whom had ipsilateral medial rectus recession for esotropic DRS Type I in addition to a contralateral medial rectus recession, and can be explained by the same mechanism. Although this phenomenon has been previously recognized following large medial rectus recessions in DRS eyes (3,7,8), not all authors limit their medial rectus recessions for DRS eyes (2,10). Intraoperative “tightness” of the medial rectus muscle in the affected eye of a patient with esotropic DRS is another relative indication for limiting the amount of medial rectus recession (11).

Like Patients #2 & #3, Patient #4 underwent medial rectus recession in both the DRS eye and the unaffected eye. However, Patient #4 experienced a worsening of the preoperative left AFT (rather than a reversal). This phenomenon has also been previously recognized (7) and seems to be because a matchedduction limitation in the contralateral (non-DRS) eye can promote a compensatory face turn in the direction of theduction limitation in order to maintain binocularity in the setting of postoperative primary position strabismus. Presumably Patient #4 did not develop a face turn reversal like Patients #2 & #3 because the amount of medial rectus recession in the DRS eye was not enough to correct the relatively large primary position esotropia; contralateral medial rectus recession in this setting seems to have promoted the original AFT (7).

The concept thatduction limitation in the contralateral (non-DRS) eye can promote a compensatory face turn in the direction ofduction limitation in the context of primary position strabismus is also illustrated by Patient #5’s course. In addition to bilateral lateral rectus recessions, Patient #5 had a posterior fixation suture placed in the medial rectus muscle of the contralateral (non-DRS) eye in order to match the abduction defect in the DRS and thus “theoretically” promote abduction in the DRS eye (and thus minimize co-contraction, which occurred during adduction of that eye). However, in the setting of undercorrected primary position exotropia, the result of this treatment was a face turn toward the induced duction defect rather than promotion of abduction in the DRS eye (7).

Although good results have been
described for horizontal rectus muscle recession in the DRS eye with or without surgery in the unaffected eye to match the duction deficient of the DRS eye (2-5,11), poor results can sometimes occur in situations suggested by the current case series. The amount of ipsilateral medial rectus recession for treatment of AFT in esotropic unilateral Type I DRS should be limited if significant preoperative co-contraction is present and the degree of primary position esotropia is small; otherwise, a significant reversal of face turn may occur. Surgical matching of the DRS eye’s duction limitation in the unaffected eye can lead to a compensatory face turn in the direction of the duction limitation when there is significant, persistent, postoperative primary position strabismus.

REFERENCES
New Diplopic Restrictive STRABISMUS as a sequela AFTER CONJUNCTIVAL SURGERY for conjunctival lesions: A series of 3 cases, management and outcome.

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ABSTRACT: **Objective:** To present three clinical cases of diplopia secondary to conjunctival surgery (for tumor of caruncle and recurrent pterygium surgery).

**Patients & Methods:** Clinical data of three patients with binocular diplopia and incomitant esotropia associated with compensatory torticollis and duction limitation are shown and discussed. In all cases, a complete ophthalmological examination was performed including ocular motility study, duction test and preoperative evaluation under general anesthesia.

**Results:** The forced duction test was positive in all cases, confirming the diagnosis of restrictive strabismus. Uneventful surgery was performed in all cases in which conjunctival adherences to eye orbit bones were eliminated and the involved extraocular muscle was isolated and freed.

Furthermore, some additional treatments were applied to avoid recurrence (subconjunctival and topical corticosteroids, amniotic membrane and therapeutic contact lens). One case presented postoperatively a new conjunctival adherence in spite of such anti-recurrence treatment although with no significant motility alterations associated.

**Conclusions:** Conjunctival surgery can cause fibrosis and conjunctival adherences leading to restrictive strabismus. The surgical procedure for solving this problem must be performed with special care to avoid complications and recurrences. The use of antimetabolites or amniotic membrane seems to be recommendable to ensure a satisfactory postoperative outcome.

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INTRODUCTION

The presence of restrictive strabismus after multiple conjunctival surgical procedures or after very complex surgeries is a complication that should be considered. It is not a rare condition after pterygium surgery in patients that have undergone several surgical procedures due to recurrences (1-3).

Likewise, this complication may also appear after more aggressive surgical procedures such as conjunctival tumour removal. The motor alterations associated to this type of strabismus may be due to direct affectation of extraocular muscles with limitation of the field of action of a specific muscle (2,3) or to an adherential process secondary to the presence of fibrotic areas limiting the contralateral movement of the eye (4).

We present three cases of restrictive strabismus after conjunctival surgery, one after excision of a conjunctival tumour and the other two after multiple pterygium surgical excisions.

CASE REPORTS

Clinical Case 1

A 68-year woman attended to our clinic with complaints of diplopia. The patient compensated partially for this diplopia by turning the head. As ophthalmological antecedents, the patient referred surgery for the removal of a caruncle tumour in the left eye (Figure 1A, top left, next page) one year before, with the perception of a constant diplopia immediately after surgery. This condition was diagnosed as a post-surgical VI nerve palsy. At our examination, the patient had a decimal visual acuity of 0.9 in both eyes, and a Goldman intraocular pressure of 16 and 18 mm Hg in right and left eyes, respectively. The biomicroscopic exam showed a conjunctival scar in the nasal area of the left eye and an incipient phacosclerosis in both eyes. No abnormalities were detected in the fundus examination. Regarding ocular motility, a left eye esotropia of 15 prism diopters was present in the primary position, with abduction (-4), and supra- and infradduction limitations (-2) (Figure 2A, top, next subsequent page). The patient presented compensatory head position with head rotation to the left. Furthermore, the forced duction test was positive for all directions, especially for abduction.

Surgery was planned for the correction of this strabismus. First, the left eye medial rectus muscle was carefully examined. A great amount of fibrotic adherential tissue between the muscle and the orbital wall was found (Figure 1B, top right next page). These fibrotic adherences were then removed with special attention to the different anatomical planes. The forced duction test was repeated during dissection until it was finally negative. After this, 0.5 ml of triamcinolone acetonide (Trigon Depot, Bristol-Myers Squibb, Madrid, Spain) was injected subconjunctivally.

Motor exercises were prescribed postoperatively (prism vergence exercises and Brock’s string) as well as a combination of topical steroid and antibiotic (Tobradex, Alcon, Fort Worth, Texas, USA) to be applied four times daily for two weeks and two times daily during the following two postoperative weeks.

After the first postoperative month, this prophylactic treatment was substituted by non-steroidal anti-inflammatory drops (Dicloabak, Laboratorios Thea, Barcelona, Spain) to be applied during one additional month three times daily. Furthermore, the use...
Figure 1. (Laria et al): A- Clinical case 1, caruncle tumour, preoperative; B- Clinical case 1, adherences between medial rectus and orbit wall, surgery; C- Clinical case 2, amniotic membrane transplantation and “Illig” contact lens, surgery; D- Clinical case 2, new conjunctival adherence after contact lens withdrawal, postoperative; E- Clinical case 3, pterygium recurrency in right eye; F- Clinical case 3, pterygium recurrency in left eye.
...of artificial tears was recommended during all this postoperative period (Systane, Novartis AG, Basel, Switzerland). Two months after surgery, orthotropia was present, with no torticollis, excellent conjunctival healing, and slight abduction limitation (-1) in the left eye (see also Figure 2B, top right, below).

**Clinical Case 2**

A 47 year-old presented to our clinic with strabismus and diplopia in dextroversion that can be compensated by turning the head horizontally to the right. As antecedents, the patient reported that he had undergone 11 pterygium surgeries performed by different surgeons in the right eye. In the last three surgeries, mitomycin C 0.3% was applied during two minutes in the affected area, with a subsequent conjunctival autografting. Furthermore, conjunctival biopsy was negative for pemphigoid in two occasions. The patient reported a significant worsening of the diplopia after the last surgical procedures.

At our examination, the patient had a decimal visual acuity of 1.0 and 0.8 in right and left eyes, respectively. The Goldman...
intraocular pressure was of 16 and 18 mm Hg in right and left eyes, respectively. The biomicroscopic exam showed large amounts of scar tissue in the nasal conjunctival area of the left eye, with the presence of symblepharon. No abnormalities were detected in the fundus examination. Regarding ocular motility, a right eye esotropia of 25 prism diopters was present in the primary position, with abduction (-4), and supra- and infraduction limitations (-2). The patient presented compensatory head position with horizontal head rotation to the right (Figure 1C, prior page 115, middle frame, left). Furthermore, the forced duction test was positive for all type of ductions, especially for the abduction.

Surgery was planned for the correction of this strabismus. A great amount of fibrotic adherential tissue was found between the medial rectus, and the bulbar and palpebral conjunctiva. This tissue was carefully eliminated until the forced duction test was negative. The symblepharon was separated as completely as possible, with elimination of all adherences to the muscle. Afterwards, a medial rectus recession and a lateral rectus miectomy were performed. As the conjunctival tissue of the affected area could not be repaired, it was covered with an amniotic membrane graft to avoid potential recurrences (Figure 1C see page 115). In addition, an “Illeg” contact lens was adapted (see aforementioned Figure 1C).

In the immediate postoperative period, the patient was left with a residual exotropia of 5 prism diopters and adduction limitation (-2), considering the potential development of recurrences. A combination of topical steroid and antibiotic (Ciloxadex, Alcon, Fort Worth, Texas, USA) was prescribed to be applied four times daily during the first postoperative 2 weeks. Furthermore, the use of artificial tears was recommended during all this period (Systane, Novartis AG, Basel, Switzerland). After contact lens removal, a recurrence of the conjunctival adherence appeared (Figure 1D). In spite of it, the patient showed a satisfactory postoperative outcome, with a slight adduction limitation (-1) in the right eye (see Figure 2D, prior page 116, right middle frame), no diplopia in primary position and the absence of torticollis. This situation was maintained during the initial 6 months after our surgery.

At 12 months postoperatively, orthotropia without torticollis was present, but with an abduction limitation due to the recurrence of the symblepharon. The conjunctival biopsy was repeated one more time and it was positive for “mucous membrane pemphigoid”. For this, Oral immunosuppressor treatment with methotrexate 10 mg/week (Ervemin, IVAX Argentina) was then initiated and maintained to this date.

Clinical Case 3

A 58 year-old man attended to our clinic with diplopia secondary to multiple surgeries for bilateral pterygium removal. He normally uses a prism of 7 prism diopters base out that however does not compensate for his diplopia. The patient reported that the perception of double vision was initially intermittent and it worsened progressively. Specifically, he described that the perception of constant diplopia began 1 week after the second pterygium surgery in the left eye. One year after this surgical procedure, another pterygium surgery was performed in the right eye with amniotic membrane graft, but the pterygium relapsed two months after.
At our examination, the patient presented a decimal visual acuity of 1.0 in both eyes with spherocylindrical correction (Right eye: +2.00 -1.00 x 80°; Left eye: +1.50 -0.50 x 90°). In the ocular motility examination, an incomitant esotropia of 15 prism diopters in primary position was observed. This deviation increased to 20 prism diopters with right hypotropia of 12 prism diopters in levoversion, and decreased to 10 prism diopters in dextroversion. In addition, an A-pattern was observed, with 20 prism diopters of esotropia in supraversion and a deviation of significantly less magnitude in infraversion (See on prior page 116, Figure 2E, lower left frame). The biomicroscopic exam showed a thickened nasal conjunctiva in the right eye with vascularisation, the absence of semilunar fold and the presence of a hyperemic caruncle and a relapsed pterygium. In the left eye, a relapsed pterygium was also observed, but with a less degree of conjunctival hyperemia compared to the right eye (See on prior page 115, Figure 1E and F, bottom row).

Surgery was planned in the left eye. It presented a positive forced duction test for the abduction. In addition, a limbar area with strong adherences of the conjunctiva to sclera was found as well as a medial rectus adhered to the conjunctiva, with infiltration, fat and fibrosis until the septum. After dissecting and releasing the adherences, a 2-mm recession of the medial rectus was performed by using the technique of the delayed adjustable suture with implantation of a silicone sheet (Silastic) under the muscle. Triamcinolone acetonide was then injected in the internal-superior angle.

In the immediate postoperative period, the diplopia disappeared in primary position. A combination of topical steroid and antibiotic (Ciloxadex, Alcon, Fort Worth, Texas, USA) was prescribed to be applied four times daily during the first postoperative 2 weeks. Furthermore, cyclosporine 0.05% (Lacrinmune, Bausch & Lomb Argentina) was prescribed to be applied two times daily during the first postoperative 6 months. The satisfactory immediate postoperative outcome was maintained during the first postoperative year (See Figure 2F on page 116 lower right frame), with only the presence of diplopia in extreme left gaze due to a residual esotropia of 7 prism diopters in this position.

**DISCUSSION**

The diplopia after anterior segment surgery can be monocular or binocular. The presence of postsurgical monocular diplopia is normally related to irregular astigmatism after corneal surgery (6). However, the postsurgical binocular diplopia may be due to a direct trauma over the adjacent muscle (1-3) as well as to the presence of adherential tissue leading to a subsequent motor restriction (4). The differential diagnosis of these two conditions leading to postsurgical binocular diplopia is based on the ocular motility exploration (See Flow chart in Figure 3, next page). The direct damage of an extraocular muscle will originate a limitation in the field of action corresponding to the affected muscle, whereas an adherential restriction will mainly affect the contralateral field of action, although other fields may be also limited depending on the level of fibrosis. In this last condition, incomitant esotropia may also appear, with a larger deviation when the affected eye is fixating (7).

The forced duction test is also crucial for the diagnosis because a negative outcome confirms the absence of restrictions and then
of an adherential problem. In the clinical cases reported here, a negative forced duction test was achieved after the elimination of the adherential tissue generating the restriction, with necessity of additional muscle surgery in two cases, as reported by other authors (7). The potential generation of new adherences should be considered during the postoperative follow-up. The use of conjunctival autograft transplantations has been proposed as a procedure to avoid recurrences with these type of surgeries (8).
The clinical case 2 reported here shows a right eye esotropia causing a very significant discomfort to the patient, because this eye was the dominant eye. Incomitancy was present for lateral gazes as well as for fixation changes between eyes. In this specific case, the conjunctival affected area was covered with an amniotic membrane due to the impossibility of repairing the conjunctival tissue. Likewise, an “Illeg” contact lens was adapted to protect against recurrences of adherences and symblepharon. The early contact lens withdrawal due to abundant secretions not tolerated by the patient facilitated the partial recurrence of the symblepharon which did not however generate significant restrictions. The patient presented postoperatively with no torticollis and orthotropia in primary position. For this reason, we preferred to wait and see the evolution. It was especially curious that two biopsies were negative and only the third biopsy after the last conjunctival surgery was positive for mucous membrane pemphigoid.

The third clinical case shown reports a diplopia caused by a recurrent pterygium (9), with the more significant disturbances when the fixating eye was operated on, with the subsequent mechanical restrictive limitations. This case was solved by eliminating the adherences and by the topical use of antimetabolites for 6 months. In contrast to other authors (8), the first clinical case reported here showed another case of diplopia due to a restrictive strabismus in which the elimination of the adherences was enough to solve the problem, with no necessity of an additional muscle surgery.

In general, the surgery in restrictive strabismus after conjunctival surgery must be very meticulous. The different anatomical planes must be respected as maximum as possible in order to avoid new adherential processes (10,11) and the damage the medial rectus muscle (12). Furthermore, it should be considered that the strabismus surgery in these cases is not concluded until obtaining a negative outcome with the forced duction test. Another factor to consider is the intra- and postoperative treatment to avoid the recurrence of the adherential process. Intraoperatively, special care must be taken with the conjunctival closure to prevent future new restrictions. Currently, there is still a debate regarding the applicability of the intraoperative use of mitomycin C (13), subconjunctival or periorbitary corticosteroids and even the possibility of autografts (7) or amniotic membrane transplantations, as in the clinical case 2 reported here, to avoid recurrences. More scientific evidence about the mechanism of action and efficacy of this type of treatments are necessary in the future. We considered that in cases like those presented in the current case report, the short-term and long-term monitoring is necessary to evaluate if new adherences are created and their motor impact. Thus, the clinician will be able to plan as soon as possible new surgeries if required to avoid motor restriction with significant clinical impact.

In conclusion, a very meticulous procedure should be always followed in anterior segment surgery during the manipulation of the different anatomical planes to avoid the creation of postoperative restrictive phenomena. The forced duction test is a crucial test for confirming the diagnosis of a restrictive condition. The potential recurrence of adherential processes should be always considered. The treatment to apply should be customized according to the specific features of each condition.
REFERENCES

ABSTRACT: **Purpose:** To report a patient with medial rectus muscle entrapment as a complication of endoscopic dacryocystorhinostomy (EDCR).

**Method:** A 34 year old female was referred with diplopia 18 days after EDCR for the treatment of primary nasolacrimal duct obstruction. She had a large angle left exotropia in primary position as well as a complete limitation of adduction and partial limitation of abduction of left eye. CT scan showed large fracture of the medial orbital wall in which the medial rectus muscle was entrapped. She underwent multiple procedures in order to release the entrapped muscle as well as management of the diplopia.

**Result:** Finally the patient had 10 PD exotropia in primary position but could fuse with a small face turn.

**Conclusion:** Orbital wall fracture with medial rectus extraocular muscle entrapment as a complication of EDCR should be kept in mind.
INTRODUCTION

Dacryocystorhinostomy (DCR), as a routine management of the nasolacrimal duct obstruction, is one of the most common ophthalmic surgical procedures. The gold standard method of DCR is the external approach introduced by Toti in 1904 which has not change significantly over a century (1).

Transnasal endoscopic DCR on cadaver and on live patients was introduced in 1988 and 1989 by Rice, and McDonogh & Meiring respectively (2,3). Nowadays endoscopic DCR is considered as an alternative method for external DCR. Lee, Chai & Loon compared these two methods in 2010 and showed that they are equally successful and their intraoperative bleeding was comparable, while the time of surgery was, meaningfully, shorter with endoscope DCR(4).

In addition, endoscopic DCR has the tempting advantages of avoidance of skin scars and periorbital ecchymosis as well as a shorter recovery period (5), but disadvantages: more expensive instrumentation, steeper learning curve and more frequent complications of limited-view like potential damage of the intracranial and intraorbital contents (4, 5). Other potential complications of endoscopic method include creation of inadequate fistula, granuloma formation at the fistula site and intranasal adhesions (6,7).

This article introduces a case of medial rectus muscle (MR) entrapment following endoscopic DCR and difficulties in the management of reported damage to the extraocular muscles secondary to the endoscopic nasal and sinus surgery (8), but as far as we know this is the first case after endoscopic DCR.

CASE REPORT

A 34 years old lady was referred to our clinic because of double vision and eye deviation following endoscopic DCR 18 days before referral. On examination visual acuity was 20/20 and 20/30 in the right and left eyes respectively and afferent pupillary defect was positive for the left eye. There was 60 Prism Diopters (PD) exotropia in primary position in the left eye which increased to more than 100 PD in right gaze and in left gaze there was 10 PD esotropia (Figure 1, below). The patient had complete limitation of adduction and 25% limitation of abduction in the left eye. Forcedduction test showed severe limitation of abduction and a mild limitation of adduction and the force generation test demonstrated the complete paralysis of the left medial rectus muscle.

Computed tomography of the orbit revealed left medial orbital wall fracture and...
Figure 2 (Bagheri et al): Axial (A) and coronal (B) CT scan of the orbit demonstrate the left medial orbital wall fracture and major entrapment of the medial rectus muscle.

We repaired the medial wall fracture with a silastic sheet and released the entrapped (muscle via a medial canthal skin incision Figure 3, see below).
At the end of operation, we injected 20 units of Dysport (botulinum toxin A) in the left lateral rectus. The next day the exotropia decreased to 25 PD and diplopia improved significantly, but adduction was still severely limited. With loss of the effect of botulinum toxin after 6 months, the left exotropia increased to 50 PD again and the diplopia recurred. The patient then underwent a second surgical procedure: split half tendon transposition of the medial half of the superior and inferior rectus muscles to the medial rectus with 6 mm resection. Also the left lateral rectus muscle was recessed 10 mm and 20 units of Dysport injected again in this muscle. After 3 months, the patient again developed left exotropia of about 30 PD; so we performed a third operation: a left lateral rectus disinsertion and released this muscle into Tenon’s space after also cutting off about 10 mm of its length (myectomy). We also fixed the globe with a scleral traction suture to the medial wall for 5 days after operation. Exotropia decreased to 10 PD and, for the first time, the patient could fuse in primary position with a small angle right face turn. This improvement in primary position was obtained and accompanied by a near complete loss of abduction in addition to adduction (see Figure 4, below).

In addition to strabismus the patient had decreased vision and positive afferent pupillary defect at presentation. Further evaluation showed optic atrophy and a deep arcuate superior visual field defect in the left eye (Figure 5, below). Vision and binocular alignment were stable after 6 months of the last operation.

Figure 5 (Bagheri et al): Visual field of the left eye demonstrates a deep arcuate scotoma in the superior half of the field.

Figure 4 (Bagheri et al): One month after the last operation, the patient had small angle exotropia at primary position but she was able to fuse with a small face turn (A, B and C).
DISCUSSION

Traumatic medial orbital wall fracture is less common than inferior orbital wall fracture but it can be seen even in a minor orbital trauma and may be associated with medial rectus muscle entrapment (8). Medial rectus entrapment is a known complication of orbital trauma and endoscopic surgeries of paranasal sinuses (9) but, according to our literature search, medial rectus entrapment and traumatic injury of the optic nerve have not ever been reported following endoscopic DCR.

Occasionally, intranasal surgeries for treatment of nasal polyps or anterior ethmoidectomy lead to MR damage (9). In addition, endoscopic sinus procedures, especially when performed on the middle and posterior ethmoidal air cells may increase the risk of injury to the extraocular muscles especially medial rectus (10).

Although damage to the MR during endoscopic sinus surgery is an uncommon complication (11), it should be considered when the patient has diplopia after this operation and the adduction is limited.

The probable mechanisms for MR damage during operation include direct cutting of the muscle, damage to the nerve or vessels of the muscle, adhesion of the muscle to the adjacent tissues and finally entrapment of the muscle in the defect of the orbital wall (12). In our patient, the positive forced duction test in abduction and adduction was in benefit of left MR entrapment and the contracture of the left lateral rectus secondary to exotropia. The mechanism for weakness of force generation in left MR seemed to be the damage to the motor nerves of the medial rectus or the damage to the myofibrils of the MR itself.

Huang et al (11) classified the injuries to the MR following endoscopic sinus surgery into 4 patterns:

In the first pattern the patient has large exotropia and complete adduction limitation while the abduction is normal and the mechanism is complete transection of the midportion of the medial rectus (paralytic pattern);

In the second pattern, in which the exotropia is moderate to severe and both the abduction and the adduction are defective, the mechanism is contusion of the MR associated with MR entrapment (paralytic/restrictive pattern);

In the third pattern, the patient has mild esotropia and severe abduction limitation, and its mechanism is pure MR entrapment without its contusion (restrictive pattern); and

The fourth pattern consists of a mild deviation of the eye secondary to muscle contusion but there is not entrapment or nerve damage (paretic pattern) (11). Our patient was similar to the second pattern, although the abduction was relatively good. Optic nerve damage suggests that the posterior fibers of the MR muscle may be involved considering the proximity of these fibers with the optic nerve. Because of the damage to the posterior fibers of the medial rectus which is near the optic nerve, damage to the optic nerve was also explained.

CT scan is an important tool to evaluate the bony defects of the orbit and the position of the soft tissues in relation to bony orbit. Sometimes exact evaluation of soft tissues, especially extraocular muscles is not
possible because of hemorrhage and edema. In this condition MRI would be more helpful (13). MRI also can show the extent of the damage to the muscles.

Most authors believe that in MR muscle entrapment early intervention is indicated (14). Smith et al believe that early surgery for the fractures and muscle entrapment can prevent fibrosis of the muscle and help relieve diplopia (15). Huang and colleagues (13) stated that early intervention (within 2-3 weeks) for the muscle entrapment following endoscopic sinus surgery is easier to perform and may prevent fibrosis.

It is notable that in planning for strabismus surgery after releasing the entrapped muscle, one has to wait for the paralysis to improve spontaneously before doing extensive procedures like transposition surgery. This protocol was considered in this case. Occasionally when the paralysis is complete, transposition is not enough and we have to cripple the antagonist muscle, as we did (16, 17).

CONCLUSION

In conclusion we suggest that orbital wall trauma and medial rectus muscle entrapment and also concurrent optic nerve damage are included in the list of the complications of endoscopic DCR. In addition, in management of the patients with strabismus following this condition, similar to the entrapment following other endoscopic nasal and sinus procedures, one should try to release the entrapped muscle immediately and remember that the muscle damage may have complex mechanisms which need an appropriate management.

REFERENCES

ABSTRACT:  **Background:** Asymptomatic - or minimally so, eye conditions like uveitis, iritis, and glaucoma are silent stealthily blinding diseases, especially when present in children. The iritis that accompanies Juvenile Idiopathic or Rheumatoid Arthritis (JIA or JRA) is characteristically asymptomatic. Children with these must be examined regularly and routinely (see Reference 1 and Table) on an ophthalmologic biomicroscopic slit lamp for the microscopic cells (and aqueous flare) which occur in the anterior chamber of the eye, signaling the presence of iritis, and an immediate need for anti-inflammatory agents. Such an exam is also indicated when the so afflicted develop most any symptoms of a new or recurrent eye problem.

Slit lamp iritis determination remains challenging. It virtually requires a major, not portable, table mounted and expensive biomicroscope. And the examiner designated in schedules (1) is a trained ophthalmologist, an "Eye M.D.". Both.

There are times and places throughout the world where and when a slit lamp may be available but there is no Eye MD (or qualified ophthalmic technician or assistant) available in a timely manner to timely examine for iritis when such is needed as noted.

However, there are theoretical advantages if a **parent** could detect iritis in their JIA child if a slit lamp were available, if they had been trained to use it and recognize iritis cells and flare.

**Methods:** A portable model of varying iritis severity was developed. Parents of JIA patients were instructed on slit lamp use and then attempted to match unknown models of iritis severity with known training models of varying concentrations of cells and flare.

**Results:** Twelve parents ranked the 5 unknowns with an average summed deviation from expected of 2.2 +/-2 grade levels (out of 12). This was a good and useful degree of training.

**Conclusion:** We were able to teach lay adults to match a model of iritis severity on a slit lamp. We would suggest that where needed, they could provide urgent and more convenient and faster diagnosis and treatment of recurrent iritis and also augment recommended scheduled Eye MD screening for iritis in JIA patients providing an effectively higher level of care, quality of life, and reduction in loss of vision for JIA victims at lower cost and greater facility for the patients, their caregivers and society as a whole.

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The authors, as of this time, have no financial interest in this work.
BACKGROUND

Asymptomatic - or minimally so, eye conditions like uveitis, iritis and glaucoma are silent stealthily blinding diseases, especially when present in children. The iritis that accompanies Juvenile Idiopathic Arthritis (JIA or JRA) is characteristically asymptomatic. Children with these must be examined regularly and routinely (see Reference 1 and Table) on an ophthalmologic biomicroscopic slit lamp for the microscopic cells (and aqueous flare) which occur in the anterior chamber of the eye, signaling the presence of iritis, and an immediate need for anti-inflammatory agents. Such an exam is also indicated when the so afflicted develop most any symptoms of a new or recurrent eye problem.

Slit lamp iritis determination remains challenging. It virtually requires a major, not portable, table mounted and expensive biomicroscope. And the examiner designated in schedules (1) is a trained ophthalmologist, an "Eye M.D.". Both.

There are times and places throughout the world where and when a slit lamp may be available but there is no Eye MD (or qualified ophthalmic technician or assistant) available in a timely manner to timely examine for iritis when such is needed as noted.

INTRODUCTION

How does one learn how to detect and grade iritis? Iritis observation is difficult because patients are often exquisitely photophobic and the slit lamp adjustments must be optimized in order to visualize 7 micron white cells floating in the aqueous humor. First-year ophthalmology residents with patient mentors wait for days and weeks to find exemplary clinical cases. Family physicians and Emergency Specialists have far less opportunity to hone slit lamp skills.

The iritis that accompanies Juvenile Idiopathic Arthritis (JIA or JRA) is characteristically asymptomatic. Potentially blinding sequelae such as cataract, synechiae and glaucoma can result from undetected iritis, or with excess corticosteroid therapy. Balancing short term side-effects with cost and inconvenience, the American Academy of Pediatrics (AAP) and rheumatologists have produced scheduling guidelines for pediatric ophthalmology slit lamp examinations for all suspected JIA patients based on gender, age and other factors (1).

A different, systemic/ocular condition, diabetes mellitus, previously required scheduled doctor and lab visits, whereas current home monitoring of serum glucose affords tighter therapeutic control and substantially less blindness.

We postulate better control and outcomes for JI&RA iritis could result from augmenting (not supplanting) regular ophthalmic exams by adding some home monitoring of iritis severity.

Therefore, we developed a model for slit lamp grading of iritis. This study is a pilot study to determine whether we could teach parents, lay volunteers to accurately match model severity using an eye slit lamp.

METHODS

With approval from IRB at Providence Hospital, parents and friends of JIA patients participated in the initial assessment of a model of iritis severity mounted on a community slit lamp. Each observed an educational video about iritis and white cell...
grading and then was familiarized with slit lamp adjustment and use in less than an hour.

Then, after consent, each observed a model of iritis severity and attempted to match them to randomly assorted unknowns in a similar model.

**Development of the Model:**

![Figure 1 (Arnold et al): Two iritis kits: top with labeled known concentrations of suspended white particles (oak) and bottom with color-coded unknowns in nylon housing. Malleable wires suspend the kits from the forehead rest of any slit lamp.](image)

Off-white, fine particulate matter was filtered, dissolved in purified water and treated with ethanol to make a non-toxic, sterile suspension. From this, varied concentrations were placed in small clear glass vials to approximate different grades of iritis from grade 1 to grade 4 (high concentration). An additional vial held pure water to represent grade zero aqueous humor.
Five vials were then placed in a kit that could be suspended from the forehead rest of any slit lamp (Figure 1, prior page 131). One type of kit had the five vials labeled as to the concentration (0-4), and a second was color coded to represent "unknowns". An educational video was made comparing actual slit lamp examinations of patients with iritis, to views of the model. See video at: http://vimeo.com/robertarnold/homeiritiskit

RESULTS

Twelve individuals, average age 42 years, ranked all 5 unknowns at a slit lamp. The average summed deviation from expected was 2.2 +/- 2 grade levels, on a potential 12 point spread, with 5 scoring a perfect 0, and the worst scoring 4 (switching just two levels). The average deviation for grade zero iritis was just 0.2 grade levels (Figure 2, next page).

CONCLUSION

To our knowledge, there is no model of clinical iritis for teaching, yet. Our proposed method of slit lamp familiarization, video viewing and then observation of an iritis model could enhance teaching about slit lamp detection of anterior chamber cell concentration.

Lay adults were able to reliably match corresponding varied concentrations of suspensions of fine, white particles in a model resembling iritis. While their agreement was not perfect, these results encourage further investigations as to whether parents and friends would be able to accurately grade iritis in JIA patients. A community service clinic, or organization such as the Lions Club, could potentially maintain a slit lamp for family use. More frequent, lay monitoring of uveitis might afford an enhanced balance of treatment and follow-up formal eye examinations.

REFERENCE


Please see Table (from the American Academy of Pediatrics), page 134
Figure 2 (Arnold et al): Results of slit lamp comparisons by lay individuals of known and unknown iritis kits for 12 individuals who had watched an educational video, then familiarized themselves with slit lamp use in less than one hour.
FROM THE AMERICAN ACADEMY OF PEDIATRICS

Ophthalmologic Examinations in Children With Juvenile Rheumatoid Arthritis

<table>
<thead>
<tr>
<th>Type</th>
<th>ANA</th>
<th>Age at Onset, y</th>
<th>Duration of Disease, y</th>
<th>Risk Category</th>
<th>Eye Examination Frequency, mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oligoarthritis or polyarthritis</td>
<td>+</td>
<td>≤ 6</td>
<td>≤ 4</td>
<td>High</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>≤ 6</td>
<td>&gt; 4</td>
<td>Moderate</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>≤ 6</td>
<td>&gt; 7</td>
<td>Low</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>&gt; 6</td>
<td>&gt; 4</td>
<td>Low</td>
<td>Low</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>&gt; 6</td>
<td>&gt; 4</td>
<td>Low</td>
<td>Low</td>
<td>12</td>
</tr>
<tr>
<td>Systemic disease (fever, rash)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>Low</td>
<td>12</td>
</tr>
</tbody>
</table>

ANA indicates antinuclear antibodies; NA, not applicable.

Recommendations for follow-up continue through childhood and adolescence.
Vision / Visual Acuity / Amblyopia


The demonstrated feasibility of radial deformation stimuli for forced-choice preferential looking testing and the sensitivity and specificity of the small radius radial deformation hyperacuity stimulus for amblyopia support the potential to utilize this test to detect and monitor amblyopia in infants and preschool children. (vsubramanian@retinafoundation.org)


The World Health Organization estimates that 13 million children aged 5-15 years worldwide are visually impaired from uncorrected refractive error. ... School-based vision screening carried out by teachers, [etc may remedy this] ... Barriers to [this]... include the cost and quality of available refractive care and mistaken beliefs that glasses will harm children’s eyes. Further research...needed...cost-effectiveness...and impact of education to promote acceptance... School vision programs should be integrated into comprehensive efforts to promote health children and their families. (ncongdon1@gmail.com)

Anisometropia in Children from Infancy to 15 Years. Deng L, Gwiazda JE. Invest Ophthalmol Vis Sci 2012 [Authors Conclusions]

The prevalence of anisometropia increases between 5 and 15 years, when some children’s eyes grow longer and become myopic. However, anisometropia was found to accompany both myopia and hyperopia, suggesting that other mechanisms in addition to excessive eye growth may exist for anisometropia development, especially in hyperopia. (Dept Vision Science, New England College Optometry, 424 Beacon St, Boston MA 02115)


- Foveal sensory eye dominance (SED) is reduced by the push-pull training protocol.
- The push-pull protocol excites the weak eye while inhibiting the strong eye.
- The learning effect (reduced SED) transfers within the same orientation channel.
- The learning effect transfers to a spatial frequency 1 octave higher than trained.
- The learning also transfers to other untrained binocular tasks.

Strabismus Pathophysiology

Measuring the Accommodative Response with a Double-Pass System: Comparison with the Hartmann-Shack Technique. Vis Res 2012; 62:26-34 [AAOs Science Direct]

Highlights: • Accommodation response was measured with double-pass and Hartmann-Shack systems. • No significant differences were found among metrics. • No significant differences were found in the results obtained with both techniques. • Slightly higher accommodative responses than those previously published were found in this study. • Double-pass might be a helpful tool for accommodative response measurement based on retinal image quality. [No Author Information]

Responses of Cells in the Midbrain Near-Response Area in Monkeys with Strabismus. Das VE. Invest Ophthalmol Vis Sci 2012; May 3 [Author Abstract]

Purpose: To investigate whether neuronal activity within the supraoculomotor area (SOA-monosynaptically connected to medial rectus motonerurons and encode vergence angle) of strabismic monkeys was correlated with the angle of horizontal misalignment and therefore helps to define the state of strabismus. Methods: Single-cell neural activity was recorded from SOA neurons in two monkeys with exotropia as they performed eye movement tasks during monocular viewing. Results: Horizontal strabismus angle varied depending on eye of fixation (Dissociated
Horizontal Deviation) and the activity of SOA cells (n=35) varied in correlation with the angle of strabismus. Both near-response (cells that showed larger firing rates for smaller angles of exotropia) and far-response (cells that showed lower firing rates for smaller angles of exotropia) cells were identified. SOA cells showed no modulation of activity with changes in conjugate eye position as tested during smooth-pursuit thereby verifying that the responses were related to binocular misalignment. SOA cell activity was also not correlated with change in horizontal misalignment due to A-patterns of strabismus. Comparison of SOA population activity in strabismic animals and normal monkeys (described in the literature) show that both neural thresholds and neural sensitivities are altered in the strabismic animals compared to the normals. **Conclusions:** SOA cell activity is important in determining the state of horizontal strabismus possibly by altering vergence tone in extraocular muscle. The lack of correlated SOA activity with changes in misalignment due to A/V patterns suggest that circuits mediating horizontal strabismus angle and A/V patterns are different.

**Related Neuro-Ophthalmology**


... neurodevelopmentally normal children... The duration... was highly variable:... lasted between 3 s and 10 min in 50% of the cases, ...5 s to 30 min and long... 10 s to 2 h. The frequency ranged from one every 3 months to 10 per day. ... onset under 2 years of age,..eventual improvement and recovery, and impaired movement coordination [in some]. *(Dr. Mario Bianchetti, Dept Pediatrics, Mendrisio and Bellinzona Hospitals and University of Bern, Switzerland).*

**Perception of Depth**

**Integration Time for the Perception of Depth from Motion Parallax.** Nawrot M, Stroyan K. *Vis Res* 2012; 59:64-71 [from AAO Science Direct Highlights]

- Perception of depth from motion parallax occurs with brief stimulus presentations (30ms). • A high-contrast pattern mask can interrupt this with an SOA less than 70-75 ms. • The masking interval might be tied to the latency of eye movement processing. • Mechanisms serving the perception of depth from motion parallax are not necessarily sluggish. [from Authors Abstract] ... that relative depth discrimination can be performed with presentations as brief as 16.6 ms, with only two stimulus frames providing both retinal image motion and the stimulus window motion for pursuit (mean range = 16.6-33.2 ms). ... neural mechanisms serving depth from motion parallax generate a depth estimate much more quickly than previously believed. ... *(Mark Nawrot, Center for Visual Neuroscience, Dept Psychology, North Dakota State University, Fargo ND 58108)*

**Binocular Vision / Eye Movements**

**Stereopsis and Binocular Rivalry are Based on Perceived rather than Physical Orientations.** Chopin A, Mamassian P, Blake R. *Vis Res* 2012; 63:63-68. [Highlights from AAO’s Science Direct]

- Orientation disparity between dichoptically viewed lines can yield 3D slant. • Orientation disparities exceeding a limit produce rivalry, not 3D slant,. • Illusory line tilt can be induced by short lines placed on a long line (Zoollner). • Illusory tilt influences disparities defining the transition from slant to rivalry. • Rivalry and stereopsis rely on illusory rather than displayed orientations.

**Reconsidering Yarbus: A Failure to Predict Observers’ Task from Eye Movement Patterns**

*Vis Res* 2012; 62:1-8 [from AAOs Science Direct] Highlights: • Yarbus (1967) showed that eye movement patterns look different depending on task. • We used pattern classification to see if task could be predicted from eye movements. • Both classifiers and human observers failed to predict task.
HYDE PARK EDITORIAL: The Editor's Soapbox, Sandbox & B'LOG
(Prehistoric) Since 1985

CONSCIENCE and CONSCIOUSNESS: Close Words,
BUT R#1 is still Stereo 3D BV via the Egocenter; also:
Cameron, SpecsX4, Brazil, Lying, Losing a +61% GAIN.

Stereoscopic 3 Dimensional depth perception vision remains
the Acme, Epitome and GOAL of all of both (monocular) vision and
Binocular Vision.

It’s the Very Foundation
of Ego-Centric Localization,
Your Very Own Cornerstone of
SPACE and your unique world
for you, and us, live in 3D.

Those first two words, “Conscience and
Consciousness” are only a couple of inches
separated in the dictionary. They even have
virtual equivalence in more remote “obsolete”
meanings. But primary meanings differentiate
well: respectively: “right and wrong” versus;
“awake, aware” But “conscience” is in the news
much lately, invaded by our president with the
cudgel of insurance covering his anti-religious
anti religion intentions. The Catholic church and others cry “FOUL!” that this, his latest healthcare insurance
ploy, is an incursion on CONSCIENCE. That conscience Is somehow sacred and inviolate as a deep inborn
feeling of right and wrong, that is therefore always RIGHT (for each person), as if it were virtually genetic.
Maybe yes, some of those feelings are related to human individual and species survival, but... we think all
those deeply held “beliefs” are not genetic, not DNA... they are most or all epigenetic at the most, the result
of teaching and training, not as adults with choice, but as young children, choiceless, helpless subjects. Most
formative: Parents! Next, religion: And where do all the rapidly reproducing Muslims get their “conscience”:
Those Madrassas, where they get compulsory intensive learning of the Quran, including who to hate and kill.
I think they learned this technique from the Catholics, who, I understood, stood by the creed: “Give me a child
for the first seven years of their life and we have them, for life.” Both literally and figuratively, as it turns out now;
and they are still in denial at all the upper responsible levels: “U.S. Bishops Still Stonewall on Sex Abuse... Ten
Years after the ‘Dallas Charter’, church leaders keep dodging accountability,” by David Gibson, Wall Street
Journal, Friday June 8 2012 “Opinion” p.A13.Maybe the sexual revolution will provide a cure for this ancient
wrong-doing. It’s very Uphill!, the Vatican missed it, opposes anyone fiddling with all their “rules” about sex.

Theoretically in most of the world you can pick and choose your religion, but when you’re indoctrinated
from early childhood and surrounded from then on, it ain’t easy... and Religion has been with us forever,
apparently, (“the opiate of the masses”) even though the basic human need for it seems to dissipate as our
knowledge and understanding of the universe expands. But as Morgan Liddick, a local columnist, recently
pointed out, Catholicism’s mission is concerned with ephemeral other worldly objectives (saving our souls) and
could care less about us other than reproducing Catholics. Similarly for Islam, with their rage extending to their
holy book. Some of it may be ebbing (and also is our society’s moral foundation) but you should see the $ five
million dollar church just completed in our little ski tourist mountain community...

Or is that just ?Evidence of conscious conscience?
With 3-D, Cameron Raises His ‘Titanic’

IF JACK DAWSON shines up like a new penny, as Molly Brown says of the suddenly tuxedoed young hero of “Titanic,” James Cameron’s 3-D release of the 1997 meta-mega-hit shines up like gold bullion.

Until now, the process of 3-D conversion—adding the illusion of depth after a film has been shot in conventional 2-D—has mainly been a marketing ploy, a way to raise ticket prices in exchange for a less-than-uplifting experience. But Mr. Cameron has raised the process itself to the level of transformation. As a technological tour de force, his 3-D “Titanic” is constantly astonishing and sometimes magical. More than that, though, this version has deepened and enriched a film that was already rich in emotions and remarkable for its depth of detail.

There’s no way to separate the new technical aspects from the movie’s intrinsic pull, and that’s a good thing; if there were, we’d be talking about mere trickery. Jack’s shouting “I’m the king of the world!” from his perch on the prow was endearing 15 years ago; now it’s even more so, thanks to the passage of time—Leonardo DiCaprio looks so touchingly young—as well as to the addition of a virtual dimension. The below-decks dance was joyous when Rose and Jack did it way back when; now there’s a heightened sense of strong bodies leaping and whirling in vividly crowded steerage quarters that signal, more eloquently than before, the vast distance between the Titanic’s social classes.

“I want to cry already,” a young girl sitting next to me at a sneak preview said to her friend when the first archival shots of the ship filled the screen. Cry she did, but will her tears...
be the first tricklings of a global flood? A huge cohort of kids has grown up without ever seeing "Titanic" on a big screen; this release may come as a revelation.

On the other hand, the intervening years have brought sweeping changes to the movie business, almost all of them in the direction of accelerated pace, fragmented narrative, toxic irony and the mindless impact of explosions, car crashes and the like. It's possible that some of "Titanic's" passages before the collision with the iceberg will strike contemporary audiences as too leisurely, and that today's kids will be impatient, as swoony fans in 1997 were not, with such borderline caricatures as Billy Zane's despicable Cal (not to mention Kathy Bates's volcanic Molly), or such sweetly sappy moments as the one in which Jack, surveying the chaos around him, declares earnestly, "This is bad!" It's even possible that contemporary moviegoers, steeped in the excesses of computer-generated imagery, will find Mr. Cameron's elegant 3-D conversion insufficiently excessive, since it doesn't hurl solid objects or anything else in the audience's face.

I'd like to believe, though, that the conversion's main value will be to serve—as technology always should—the essential elements of the film's success, and that those elements are still potent. "Titanic" was, and remains, a pop-cultural prodigy of unabashed romanticism and unsurpassed spectacle that plays out brilliantly between indispensable bookends in which the aged Rose of the present connects us to the radiant Rose of the past.

At the same time, the new technology—or the existing technology that's been used to new effect by a masterly technician who's also a formidable artist—may be a game-changer in its own right. The history of resurgent 3-D, an earlier version of which had a brief heyday in the 1950s, turns on two relatively recent releases. One of them, Mr. Cameron's sensationally successful "Avatar," showed that 3-D could be great, but established the principle, or so we thought, that the only authentic 3-D was so-called native 3-D—the process of shooting a film from the outset with two cameras and two lenses. The other, a hapless piece of pseudo-mythology called "Clash of the Titans," was shot in two dimensions, then hastily bumped up by computer finaglings of such crudity as to establish the principle, or so we thought, that 3-D conversions were to be avoided at all box-office costs.

Now Mr. Cameron himself has sent conventional wisdom packing. How he did it is beyond my comprehension, though his secret must have been some alchemy of supercomputers and superb taste. What's for sure, though, is that conversion stands, beginning this week, as a thoroughly reputable alternative to native 3-D. For some filmmakers, it's even the preferred way to go. I say that on the basis of an enlightening conversation earlier this week with Barry Sonnenfeld, who was a cinematographer on "Raising Arizona" and "Big," among others before he became a director of such films as "Get Shorty" and "Men in Black." He's currently in postproduction on "Men in Black III," which opens in May, and which he chose to shoot conventionally, then convert to 3-D.

Mr. Sonnenfeld emphasized the matter of choice during a lunchtime show-and-tell that included photographs of a modern 3-D camera—modern in the sense of all the things it can do, but Rube Goldberg-retro in the sense of an enormous, and enormously cumbersome, rig with ancillary gizmos piled atop gizmos like some Watts Tower of digital power.

"Before we started 'Men in Black III,'" he said, "we did tests with native 3-D that were painfully slow. I like to work quickly. Comedy needs momentum, and native 3-D shooting is a momentum killer. It didn't make sense to choose a system that worked against the tone of the film."

His case for conversion, as opposed to going native, went beyond convenience into artistic control. Optical issues, together with the 3-D rig's physical attributes, would have complicated or precluded the use of the 21-mm wide-angle lens he favors for the visual energy it conveys. And native 3-D would have kept him from using film, his favored medium, since all current 3-D rigs record in digital video. Converting "MiB" in postproduction, he explained, gave him greater control of crucial functions like depth—the degree of 3-D-ness, which can't be changed once shooting starts in a native 3-D scene. I'll be eager to see the results when "Men in Black III" makes its debut, but "Titanic" already illustrates how these esoteric techniques can translate to art.

So many moments in Mr. Cameron's film stand out for intensified visual splendor: Kate Winslet's Rose, emerging from a car at the pier beneath the slowly rotating disc of her violet hat; Titanic's prow, jutting out from the screen above the first few rows of seats as the doomed vessel heads for the open sea; the industrial symphony of the boiler rooms, all afloat with the power of pounding pistons; undersea cameras threading their way through bared labyrinthine that have become haunted surroundings, a panoply of spanning new decks and glittering ballrooms that, released from flatness, open out from the screen to bring us on board. And, toward the end, the downward-gazing spectacle of the ship's upended stern, a vision of horror with multilayered enhancement. In the face of this 3-D conversion, I'm a new convert.

See clips from these films and read past reviews at WSJ.com/FilmReview. Email Joe at joesmorgenstern@wsj.com.
Re prior pages:
That amazing 3D Director-Producer Cameron is some venturesome guy. He did go down to the Titanic himself, to take some of those 3D pictures of the wreck. Most recently his submarine adventures were in National Geographic where he took his one man submarine down to the bottom (to take 3D pictures) in that deepest place in the ocean on earth, the Marianna’s trench 7 miles down, That’s more down than Mount Everest is Up !!!!

Carbon nanotube “forest” hides 3-D objects

ANN ARBOR, Mich. – A unique property of carbon nanotubes – the low refractive index of low-density aligned nanotubes – also can camouflage 3-D objects, making them look like nothing more than a flat black sheet.

The tiny cylinders, composed of one-atom-thick carbon lattices, are one of the strongest materials known to science. Carbon nanotube “forests” have a low index of refraction very close to that of air. Because the two materials affect the passage of light in similar ways, there is little reflection or scattering of the light as it passes from air into a layer of nanotubes.

Researchers at the University of Michigan realized that they could use this property to visually hide the structure of objects. They etched a 3-D image of a tank in silicon. When the image was illuminated with white light, its reflection revealed the tank’s contours; however, after the researchers grew a forest of carbon nanotubes on top of the tank, the coating soaked up the light, so nothing more than a black sheet was visible.

“This work may inspire researchers to use impedance-matched low-density and absorbing material to develop stealth technology,” said L. Jay Guo, a professor at the university.

By absorbing light instead of scattering it, the coating could cloak an object against a black background, such as that of deep space. In such cases, the carbon nanotube forest acts as a magic black cloth that conceals the 3-D object’s structure.

“We would be interested in searching to see if low-density carbon nanomaterials exist in outer space, as such materials could form a ‘dark veil’ that can render large objects undetectable by our current instruments,” Guo said.


PS on egocenters: in the POV (egocenter Point of View) like a map, there is only physical geography, NO people (other than the POV)..... because every other living thing has its own egocenter and -there would be conflicts?
-there is no room for another universe?
-other ideas?

The POV of your egocenter is the binoculars !!!!
3D TVs may soon be bargains:

The above are stale, but the latest I had. But LOOK at that 42" LG at the bottom for less than $600. I paid almost that much for my first 32" flat screen which only lasted a few weeks beyond the warranty. The current price is undoubtedly even lower.

The newest TVs recently announced will probably be 3D but they will also be your new computer and internet browser screen whenever you want it to be, and will in addition, like your auto system, respond to your voice commands and maybe also hand motions. I can hardly wait! I still can't stroke my latest camera screen very adroitly when reviewing the pictures I have just taken, and my touch panel on the computer keyboard consistently wants to translate anything that is not a perfect tactile touch into a signal to move all over the place, and to carry out somebody else's (Bill Gates') commands!!!!

Whoops, I see that X-Box, at least, has the hand signals already, and now can be adapted to act like your internet contact so I guess some people, especially gamers may have that already.

Whoops whoops: Wall Street Journal Tuesday 05 June 2012 B3: “...Smartglass” New Gaming...Will Let Tablet or Phone stream Content to a Television (screen).” Apple is working on Airplay to work with their expected Apple TV.
H2.Strabology etc

How did we miss this? The crowding phenomenon is something we all learned very early in ophthalmology... If Uncrowding helps so much here (it almost looks like a cure for some parts of these disorders?), would it help in the treatment of AMBLYOPIA ?!!! to say nothing of other types of reading and learning disabilities.....????

For dyslexic children, the standard spacing that works well for skilled readers may seem crowded, causing them to take longer to translate the letters into sounds and to make more mistakes deciphering them because the typographical features of characters blend together.

“When you increase the letter spacing, the reading improves on the fly,” says Padua neuropsychologist Andrea Facelli. The increase in reading speed worked out to about one-third of a syllable per second.

To allow people to conduct their own experiments, the researchers have introduced a free iPhone and iPad app called Dys. Users can tinker with the spacing between letters to find the one that most enhances their reading performance.

The app also allows users, if they choose, to share their findings anonymously with the researchers.

Increased spacing in text may improve reading for children with dyslexia.

The Wall Street Journal (6/5, Hotz) reports in its “Health” blog on a study appearing in the Proceedings of the National Academy of Sciences finding that wider spacing of letters eases reading for children with dyslexia. The study found a 20 percent increase in speed and a doubling of accuracy. Marco Zorzi of the University of Padua said, “It corresponds to the increase you would see after one year of schooling.” The study was based on testing of 74 children in Italy and France.

Bloomberg News (6/5, Armstrong) reports, “Finding ways to make it easier for dyslexic children to read could help improve their life skills, giving them added practice to improve learning, the authors said,” explaining, “Reading deficits must be treated by reading more -- a vicious circle for a dyslexic child,” but “our findings offer a practical way to ameliorate dyslexics’ reading achievement without any training.”

HealthDay (6/5, Salamon) reports, “Simply widening the space between letters in words markedly increases reading speed and accuracy among children with dyslexia -- an easy fix with e-books and other forms of technology that readily allow text manipulation,” according to a study of 34 Italian and 40 French dyslexic children between the ages of 8 and 14.”

WebMD (6/5, Goodman) reports, “While the strategy isn’t a cure for dyslexia...researchers say it may help some children with the condition to read more easily.”
WHAT'S NEW HOME ENTERTAINMENT TECH REBORN

EYE-POPPING

The next wave of 3-D specs look more like everyday glasses

Military Grade
Gunnar's lenses have an anti-reflective coating used in military binoculars to prevent flashes from revealing soldiers to enemies. They lose fewer rays to reflection, letting in 10 percent more light than most lenses for brighter, more vivid images. Gunnar Midnight Oxyx $150; gunnars.com

Hot Curves
To create its wrap-around lenses, which help viewers perceive shapes and distances more clearly, Polaroid uses heat and pressure to shape a lens (embedded with 3-D-enabling polarized film) into a curve. Polaroid Premium 3-D glasses $30; polaroidwear.com

Double Vision
Keeping you from looking like a 3-D dweeb on a movie date, Marchon's new EX3D line also works in the 2-D world. The circularly polarized lenses won't distort linear outdoor light and are 100 percent UV/A/B protective, so they can double as sunglasses. Marchon EX3D $30-$35; marchon.com

Home-Theater
A leader in "active-shutter" 3-D, in which lenses flicker, Vizio (along with other TV makers) is trying something new: passive circularly polarized specs. Built to the same standard used in most 3-D cinemas, they work at the movies or at home. Vizio Theater 3-D Glasses From $30; vizio.com

STYLIZED
Glasses makers are offering a lineup of chic 3-D frames to suit your own style.

Today's high-def 3-D looks amazing, but those movie-theater glasses are dull, dirty and wasteful. Every year, tens of millions of theater-provided pairs are used. Now, makers of 3-D glasses are letting you swap those frames for reusable polarized specs that look and feel more like sunglasses.

—AMANDA SCHUPAK
a decade ago, actually, 2000, I presented a paper at the annual Wilmer Eye Institute alumni meeting about the increasing threat of anisometropia to binocular vision, especially the increasing side effect of various ophthalmic surgical procedures on refraction...

To get the attention of my audience I mounted the speaker’s podium with a very miniature TV monitor I found somewhere that was about an inch or so cube, temporarily mounted to the outside corner of my eye glasses frame, and started my talk by saying that here is the future of vision and binocular vision, pointing to the small TV device and describing it as a minute computer monitor.

I didn’t at the time realize how accurate that prediction was!

This “viewfinder” (below) was in a recent issue of “Popular Mechanics, and in the lower right inset detail, it uses the goggle frame to house a micro mini monitor in the lower frame optical projected into the field of view. This is intended for skiers so the goggle is a natural vehicle.

This was before... Google, and others did it for NOT skiers, but not “before” by much.
Right and right Below: Sergey Brin cofounder of Google wearing new Google spectacle frame which contains an internet computer, and the monitor, for which, the picture is by an optical system (see diagram on the next page) displayed by reflection - like a “heads-up” pilot or driver display, on the inside of the spectacle lens. From the Wall Street Journal April 2 and May 22, 2012.

Framing a Young Rocker: The Man Who Picked Glasses for Buddy Holly

Lubbock Optometrist, Inspired by Style
Of Sgt. Bilko, Bought the First Pair in Mexico

BY CHARLES PASSY

LUBBOCK, Texas—As one of the few optometrists in this West Texas town, J. Davis Armistead reckons he saw some 10,000 pairs of eyes over a four-decade career. But the doctor, now 96 years old and retired, still remembers one lanky youth with a vexing vision problem.

The kid couldn’t see—his vision was 20/800 in both eyes, meaning he couldn’t read the top line of the eye chart. But he didn’t want to put on glasses for fear they would spoil the rebellious image he was trying to project as a musician. His name: Buddy Holly.

Mr. Holly rocketed to fame on the backs of such hits as “That’ll Be the Day” and “Peggy Sue.” He died at age 22 in a Feb. 3, 1959, plane crash but remains Lubbock’s most famous native son. Mr. Holly’s songs shaped rock ’n’ roll, influencing many of the major groups of the 1960s. But his black-framed glasses created a nerd-gone-cool image that ultimately became almost as influential as his music.

Pop-culture experts often point to those black frames as rock’s first great fashion statement, one that set the stage for countless others. Without Buddy Holly’s glasses, they say, the world would likely never have seen John Lennon in his granny-style glasses or Elton John in his oversize frames. For that matter, it might never have seen Madonna in her cone-shaped bra or...
Alternate Reality

Several companies, from Google to small firms such as Laster and Vuzix, are developing headgear that can project digital information onto the lens of glasses. Below is what such a device might look like.

1. The mini projector projects the image into the glass
2. The facets redirect the image to the eye

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Image appears projected in the distance to the user

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3. The display overlays digital information over the wearer’s field of vision.

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5. The device could connect to a smartphone so that digital information could be transferred between devices.

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4. The device could have a built-in camera to be able to transmit photos or videos of what the wearer is seeing.

Source: Lumus, Laster, Vuzix
Graphic by Alberto Cervantes/The Wall Street Journal
Now we know why there is that new fad that started a year or so ago, for just wearing spectacle rims, with no lenses. Remember our neato headline:

“Rimless Glasses used to be the ne plus ultra, Now it is GLASS-LESS RIMS”

That was a secret campaign by Google and these other folks working on the aforementioned computer spectacles because they knew people were going to have to wear an essentially naked spectacle frame to sell them to use their new device, which would require wearing spectacles all the time!

Even the military is trying to make their spectacles less ugly!: 

Apple’s NEW Retina display: what’s that? Is apple invading Ophthalmology????

Not quite: but the new I pad has so many much more pixel resolution than prior devices, anybody’s!

Numerically, it (the I pad screen) has 2 million more pixels than an HD TV screen. That is said or supposedly is as high a resolution as the human retina (is that right?) And more important, at what viewed distance???”? that info doesn’t seem available.... But that is why Steve and they call it (and named it) a “retina display”. It is going to be on the i-phone too...???? Reviews of the new screen are quite positive....
We SCOOPED the WSJ by a quarter on this identical idea which ran in our last issue, or maybe OUR article was picked up and “copied” by them.....????

This article did recommend to make your smartphone camera even smarter and a good equal: These Three essential camera apps:
- Camera+: the effects master
- Hipstamatic: the analog spirit
- Awesome Camera: Everything but the kitchen sink.

Sounds like we are turning everyone into a professional photographer.

Thanks to: we now have so much memory, you can save anything and everything? And like a pro, just save the knock-outs.

Us older photogs know that Saving is more of a curse than a blessing.

But the youngest generation has nothing else to do: No jobs, no home, no money and the guys don’t even have any interest in cars. (See AGAIN our last issue here h9, “kids don’t want cars” page 79, also confirmed in the mass news today April 3,)

And the latest cameras capture all the light rays for infinite 3D !!!!

Nikon and Target disagree: they are still buying huge 9x11 ! glossy print ads like this:

And these cover girls: (Right->) they all look the same and they all look like all the stars on the TV shows. They may not have the same make up person and plastic surgeon, but they all follow the same recipe. It’s confusing !

This one is from a feature in CR abuses of advertising. This is an ad for mascara, but the tiny footnote says her luscious lashes are not hers or the mascara but that “lash inserts were added.....”

NEXT PAGE: more looking and seeing.... Beauty IS NOW A GOVERNMENT RIGHT AND BENEFIT in Brazil!!:

The next page is an AP release. Is this the future of our world? As we said in the lead editorial, is good looks now become another inalienable, government mandated and subsidized human right?
Brazil’s poor get free beauty treatments

By The Associated Press

RIO DE JANEIRO — A machine purrs as it delivers electrical pulses deep into the saggy skin on Barbara Penha’s jawline, a high-tech treatment used first to tighten her jowls and then to sculpt her tummy.

The technique is all the rage at the chic dermatology clinics that cater to legions of wealthy women here who invest serious time and big bucks into looking their bikini best.

But Penha isn’t a socialite, nor did she fork out the $450 that a single radio-frequency session typically runs in Rio de Janeiro. The struggling housewife got the treatment free of charge at a clinic that provides the poor access to the kinds of pricey cosmetic treatments that have become almost de rigueur among Brazil’s moneymed elite.

Free Botox and laser hair removal, free chemical peels and anti-cellulite treatments may at first seem shockingly frivolous in a country like Brazil — which, despite phenomenal economic growth in recent years that has lifted millions out of extreme poverty, still battles with diseases like tuberculosis and dengue.

But the philosophy behind the more than 220 clinics across Brazil that treat people like Penha and thousands of maids, receptionists, waitresses and others is simple: Beauty is a right, and the poor deserve to be ravishing, too.

The Brazilian Society of Aesthetic Medicine’s Rio clinic has performed free procedures on more than 14,000 patients since its founding in 1997, said Dr. Nelson Rosas, who heads the Rio branch.

Good looks, doctors argue, are more than skin deep, and by treating what patients view as physical flaws doctors are often also healing their psyches.

“What’s a wrinkle? Something minor, right? Something with precious little importance,” Rosas said. “But when we treat the wrinkle, that unimportant little thing, we’re actually treating something very important: The patient’s self esteem.”

Nlcea Furtado receives a free of charge radio-frequency treatment in Rio de Janeiro, Brazil.

The notion that beauty treatments can act in much the same way as psychoanalysis, helping free patients from crippling neuroses, was pioneered over the past decades by celebrated Brazilian plastic surgeon Ivo Pitanguy.

Nicknamed the “philosopher of plastic surgery” for his intellectual and psychoanalytical take on the vocation, 85-year-old Pitanguy is largely responsible for Brazil’s reputation as a world leader in the field and a top destination for cosmetic surgery tourism.

His skill with the scalpel catapulted him to international fame — the surgeon is arguably Brazil’s second most famous person after soccer legend Pele. It’s made him the go-to man for A-list celebrities, international statesmen and royalty seeking a quick fix to their aesthetic woes. Pitanguy’s long and illustrious patient roster is said to include such luminaries as Zsa Zsa Gabor, Francois Mitterrand and Brigitte Bardot, although the discreet doctor has rarely named names.

Pitanguy’s handicraft on the world’s rich and famous allowed him to join their ranks — he commutes to Rio by helicopter from his own private island. But he has remained attentive to the less privileged.
Why We Lie

The Forces That Shape Dishonesty

In a wide variety of experiments, Dan Ariely and his colleagues have identified many factors that can make people behave in a more or less honest fashion.

Note that there are twice as many factors on the side of “Increasing Dishonesty” than there are for “Decreasing” it! Also the “Decrease” factors are what OTHERS must impose upon you! I don’t see that’s there any room at all for politicians in here. Especially when in the campaigning for office mode. Slightly better afterwards?... But then the biggest and boldest liar I have ever come across in my life holds the office of U.S. President now. Some think lawyers go to law school to get washed of everything in the above diagram and when you get your LLD Anything goes after that...except losing... And they do want to be the #1 and only real profession. That’s why they are destroying our medical profession with all their laws and regulations. Life is their football it seems. Or” life IS all politics” as “it is for [BO]” (WSJ quote).
9. Public Safety, cars: **DANGER:** Imperial government gets worse and worse all the time. The rest of this article was 3/4 of a full page, gave some history of this horror, but otherwise was no help to defend yourself from this further abuse of government. Don't Say NO (or anything) more than you have to. Prepare to prove in court everything that you do say. Ask for a lawyer now! Take the Fifth !? Say “I don’t remember... I don’t know”... If you need an example, Roger Clemens is our current poster boy. Martha Stewart with her serious jail time is our saint, our Joan of Arc. She was tried in the public media kangaroo court and couldn't disprove the accusations so she was guilty! Make the government workers unhappy and they can do this to anybody....
9. Public service, safety, continued: “Protect Yourself at ALL TIMES”

FEELING poor? You’ve got lots of company: 99.44% OF US failed to protect themselves from OUR GOVERNMENT INSTIGATED CRASH-DISASTER. WSJ noted Tuesday June 12, that the net worth of Americans in 2010 after the dust of the democrat government sponsored (Bill and Hillary and Barney) mortgage crisis settled was down to $77,000. That was down from $124,000 in 2007 before the crisis, DOWN - 40%. (~43/124)

But you have to invert the fraction to see the size of that government induced bubble: so that is 124 minus 77 = 47 over 77= 47/77 = BUBBLE UP +61% = the TRUE size of the democrat’s unlawful ideology created real estate bubble.... 61% is the VERY REAL LOSS you actually suffered and still feel because THAT’S HOW FAR YOU THOUGHT YOU WERE AHEAD OF YOURSELF AND YOU WERE! THAT WAS CORRECT.+ 61%!

“Trust Me, Watch Out for Almost Everyone,”


Pedestrian safety: NEXT: WATCH OUT FOR SCHOOL BUSES !!!!

From the National Motorists Association Newsletter, December 25, 2011 by John Bowman, NMA Communications Director. The Numbers Tell the Story ... Again. “... stop-arm cameras on school busses. These systems are designed to photograph drivers who pass by stopped school buses while they load or unload children. ... So how many Montgomery County school children were killed by careless motorists speeding by school buses in 2009? None, according to NHTSA. Overall, there were two school bus-related pedestrian fatalities in Maryland in 2009, but those were caused by the bus. The article doesn’t mention that. Nationally, NHTSA fatality numbers for school bus/pedestrian fatalities exhibit a similar pattern over the last few years. So, from 2006-2009, 83% of school bus/pedestrian fatalities were caused by the bus.

Are Normally Sighted, Visually Impaired, and Blind Pedestrians Accurate and Reliable at Making Street Crossing Decision? Hassan SE. Invest Ophthalmol Vis Sci 2012; 53:2593-2600 [Author’s Conclusions]

... visually impaired pedestrians can make accurate and reliable street crossing decisions like those of normally sighted pedestrians. When using auditory information only, all subjects significantly overestimated the vehicular gap time. Our finding that blind pedestrians performed significantly worse than either the normally sighted or visually impaired subjects under the hearing only condition suggested that they may benefit from training to improve their detection ability and/or interpretation of vehicular gap times. [Ed: They should also carry and wave white walking sticks when crossing] [email author: shhassan@indiana.edu] -per