ADULT STRABISMUS: MYTHS AND REALITY

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ADULT STRABISMUS: MYTHS AND REALITY

Myths:
1. Amblyopia is only reversible in children
2. Adult strabismus surgery is only “cosmetic” and there are no functional benefits
3. Adult strabismus surgery has high risk of postoperative diplopia.
4. Surgery success in adults is lower than in children
ADULT STRABISMUS:

When does the strabismus arise?

1. Childhood
2. New Onset
   - Innervational stroke, MS, myasthenia, CNS tumours
   - Mechanical (orbit problems) fractures, tumours, inflammation, thyroid
ADULT STRABISMUS

What symptoms do adults with strabismus have?
1. None (if longstanding)
2. Diplopia (double vision)
3. Visual confusion
4. Asthenopia / Headache
5. Torticollis
6. Psycho-social function
ADULT STRABISMUS:
MYTH 1

**MYTH:** AMBLYOPIA IS RESERVABLE ONLY IN SMALL CHILDREN

**REALITY:** AMBLYOPIA TREATMENT CAN BE SUCCESSFUL IN OLDER CHILDREN AND YOUNG ADULTS

BUT -- Not in all patients
AND -- Not fully in most
Evidence:

Small case series over many years
  (Patients well into their 3rd and 4th decades)

PEDIG studies  2000 - 07 (so far !)
An Evaluation of Treatment of Amblyopia in Children 7-<18 Years Old
Study Design

- Randomized, controlled multi-center clinical trial
- Sample size: ≥360 children (≥90 in each of 4 age groups)
- Treatment groups:
  - Control Group: Optical correction only
  - Active Group: Optical correction
    - Patching plus near activities
    - Atropine (patients <13 yrs only)
- Primary analysis: Comparison of proportion of treatment responders between treatment groups
Results
MYTH: ADULT STRABISMUS SURGERY IS ONLY “COSMETIC” AND THERE ARE NO FUNCTIONAL BENEFITS

REALITY: IT IS NEVER COSMETIC SURGERY. IT “RESTORES” NORMAL FUNCTION AND ELIMINATES SYMPTOMS
“Cosmetic” = modifying a normal structure, beautifying one’s appearance
“Reconstructive” / “Restorative” = changing an abnormal state to a normal or near normal one
FUNCTIONAL BENEFITS

1. Reduce or eliminate symptoms
2. Regain fusion (motor and/or sensory)
3. Normalize field of binocular vision
4. Gain psychosocial benefits
5. Positive cost-effective analysis
ADULT STRABISMUS:
FUNCTIONAL BENEFITS

1. Reduce or eliminate symptoms
SYMPTOMS REPORTED IN LONGSTANDING STRABISMUS:

AAPOS, 1999: 299 patients

- Diplopia
- Reading difficulties
- Eyestrain / headaches
- Driving difficulties
- Restricted visual field
- Problems with depth perception
SYMPTOMS REPORTED IN LONGSTANDING STRABISMUS:

Improved or resolved after surgery:

• Diplopia 56 %
• Reading difficulties 57 %
• Eyestrain / headaches 60 %
• Driving difficulties 65 %
ADULT STRABISMUS: FUNCTIONAL BENEFITS

1. Reduce or eliminate symptoms
2. Regain fusion (motor and/or sensory)
REGAINING FUSION IN LONGSTANDING STRABISMUS:

Kushner & Morton, 1992:

350 adults with longstanding strabismus

If postop angle is under 10 PD:

Over 80 % regained binocular vision
24 adults with longstanding strabismus -- all realigned to within 8 PD

All 24 showed peripheral fusion
REGAINING FUSION IN LONGSTANDING STRABISMUS:

Ball, Drummond, & Pearce, 1993

8 adults with longstanding esotropia or exotropia
Good vision in both eyes
Postop: All regained 60 seconds of stereopsis or better
REGAINING FUSION IN LONGSTANDING STRABISMUS:

Gill & Drummond, 1997

222 adults with longstanding strabismus

Postop:
52 % regained stereopsis
76 % has resolution of symptoms
REGAINING FUSION IN LONGSTANDING STRABISMUS:

Lal and Holmes, 2002

21 adults with longstanding strabismus and good vision in both eyes

Postop (realigned to < 10 PD):
67% regained stereopsis
Can improve over several months
ADULT STRABISMUS: FUNCTIONAL BENEFITS

1. Reduce or eliminate symptoms
2. Regain fusion (motor and/or sensory)
3. Normalize field of binocular vision ("panorama" of the binocular field)
Preop Field

Postop Field

30%
RESTORING THE STATIC FIELD OF BINOCULAR VISION:

It is possible to restore the normal panorama of the static binocular field

Wortham & Greenwald, 1989

10 patients with longstanding esotropia
All showed expanded field after surgery
RESTORING THE STATIC FIELD OF BINOCULAR VISION:

Kushner, 1994

35 adults with longstanding esotropia

34 of 35 showed expanded binocular field after surgery
CAN GAINS OCCUR IN PRESENCE OF AMBLYOPIA?

Regaining of fusion and expansion of the static binocular field are NOT affected by:
A) Direction of deviation (eso or exo)
B) Duration of strabismus
C) Presence of amblyopia

Kushner & Morton, 1992 (350 adults)
Kushner, 1994 (35 adults)
Wortham & Greenwald, 1989 (10 adults)
ADULT STRABISMUS: FUNCTIONAL BENEFITS

1. Reduce or eliminate symptoms
2. Regain fusion (motor and/or sensory)
3. Normalize field of binocular vision
4. Gain psychosocial benefits
PSYCHOSOCIAL EFFECTS OF STRABISMUS SURGERY

Satterfield, Keltner, & Morrison, 1993
43 adults with residual strabismus postop
Showed measurable impact on:

a) Self-image
b) Interpersonal relationships
c) Ability to secure employment
d) Tendency to depression/anxiety
PSYCHOSOCIAL EFFECTS OF STRABISMUS SURGERY

Burke, Leach, & Davis, 1997

31 adults undergoing surgery for longstanding strabismus

Majority showed improved qualities of psychosocial functioning after surgical realignment.
PSYCHOSOCIAL EFFECTS OF STRABISMUS SURGERY

Coats, Paysse, et al., 2000
Olitsky, Sudesh, et al., 1999

1. Large angle horizontal strabismus impacted negatively on hiring of applicants and on interpersonal perceptions
PSYCHOSOCIAL EFFECTS OF STRABISMUS SURGERY

Coats, Paysse, et al., 2000
Olitsky, Sudesh, et al., 1999

2. Esotropia effect is worse than exotropia
3. Females more adversely affected than males
PSYCHOSOCIAL EFFECTS OF STRABISMUS SURGERY

Archer, Musch, et al., 2005
Study of 98 children having strabismus surgery

Successful realignment results in improved:
1. Social relations and acceptance in peer group
2. General health perceptions
3. Confidence in motor skills
Functional Benefits:

1. Reduce or eliminate symptoms
2. Regain fusion (motor and/or sensory)
3. Normalize static field of binocular vision
4. Gain psychosocial benefits
5. Positive cost-effective analysis
1. Cost-Benefit Analysis:
   Calculates the cost of surgery per quality of life year (QALY)

2. Standard Visual Function testing (VF-14):
   Assesses the quality-of-life impact of a medical condition
1. Cost-Benefit Analyses (Beauchamp 2006):
   For adult strabismus surgery:
   US $1600 / QALY (= “very” cost-effective)

2. VF-14 Questionnaire (Sabri et al 2006):
   Significant negative subjective and quantitative effects in strabismus and amblyopia
ADULT STRABISMUS:
MYTH 3

MYTH: STRABISMUS SURGERY IN ADULTS OFTEN RESULTS IN POST-OP DIPLOPIA

REALITY: CHRONIC DIPLOPIA RARELY OCCURS FOLLOWING SURGERY
IS THERE A HIGH RISK OF POSTOPERATIVE DIPLOPIA?

White 1999, Kushner 2002

Risks:
If no diplopia with prism offset: 0 - 3%
If diplopia with prism offset: 1 - 7%
IS THERE A HIGH RISK OF POSTOPERATIVE DIPLOPIA?

Mills 2004, Scott 1995

If no diplopia preop, the risk of diplopia postop if well aligned: 2 - 7 %
MYTH: SURGERY IN ADULTS HAS A LOWER SUCCESS RATE THAN IN CHILDREN
REALITY: SUCCESS RATES ARE EQUALLY GOOD

Adults: 70 – 92 %
Children: 75 – 85 %

Summary

• “I’m not having any double vision, so I’ve been told that surgery is only cosmetic”
Summary

• We can RESTORE binocular visual field and RESTORE fusion
Summary

• IMPROVE: self-image, interpersonal relations, job-discrimination
Summary

- You have a good success rate with extremely low risk of double vision
Summary

- The surgery is extremely cost-effective