

Symptomatic ARC: A case series

KOWAL Lionel

MAHINDRAKAR Avinash

Introduction

- Albrecht von Graefe described post-operative paradoxical diplopia in 1855.
- Travers [1936]* suggested that straightening strabismic eyes takes care of ARC .

* Travers' monograph is in RVEEH library

Graefe A von (1855) Über das Doppeltsehen nach Schieloperationen und Incongruenz der Netzhäute. Albrecht von Graefes Arch Ophthalmol 2:322–329

Introduction

- **ARC & suppression** = clinical 'shorthand' for very complex neurophysiological adaptations that try to compensate for the presence of frank tropia.
- ARC prevents confusion about straight-aheadness and can allow some binocularity despite strabismus.

Introduction

- When strabismic eyes are straightened, ARC usually resolves quickly.
- Unresolved ARC will cause (paradoxical) **diplopia despite straight eyes** .
- If the ARC is profound the diplopia may persist.
- Profound ARC can often be predicted pre-operatively

Prevalence

- Jampolsky : ARC in 90% of ET $<15\Delta$
- Bagolini : ARC in 90% of ET $<10\Delta$, in 16% of ET $>40\Delta$

Jampolsky A. Retinal correspondence in patients with small degree strabismus. Arch Ophthalmol 1951;45:18-26.

Bagolini B. Anomalous correspondence: definition and diagnostic methods. Doc Ophthalmol 1967;23:346-98.

Neurological mechanism of ARC

- Tychsen JAAPOS 2000
- Strabismic c.f. straight eyed monkeys
- Strabismus & ARC requires poly- rather than mono- synaptic connection between Ocular Dominance Columns

Methods

- Retrospective review of manifest or expected symptomatic paradoxical diplopia after surgery to straighten eyes

Results

- 15 patients M : F 8 : 7
- Ages 8 - 62 yrs
- ET 3, XT 12
- Consecutive XT following surgery for Cong ET was the most common profile
- No cases of vertical / torsional ARC recognised

Results

- 11/15: \geq one PRIOR surgery (prior to the one producing symptomatic diplopia)
- 5/11 \geq 2 prior surgeries
- 6 : early onset deviation with **late** corrective surgery
- 6: ARC was predicted pre-operatively using free prisms

Results $\Sigma = 15$

- Surgery was done on 13 patients
- 2 declined surgery because of diplopia risk

Results – The Good

- 12/13 had paradoxical diplopia
 - 1/13 was expected to have diplopia; had suppression instead
- 9/12 had resolution of diplopia
- Symptoms disappeared in most by 2 - 8 w, in all 9 by 12w.
- ARC for near disappeared before distance in 4, distance first in 1
- Using Fresnel Δ to compensate for diplopia did not hinder resolution of ARC

Typical pt - having first XT surgery in her 40's

POST OP COURSE SURGERY 4/4/08

Date	D CT	D diplopia	Arm's Length CT	Arm's Length diplopia	25 cm CT	25 cm diplopia	Other
4-5 /4/08	12	40			12	40	Disability Rating 10/10
11/4	6	45	4	40	0	0	
17/4	4	45+	0	4	X'6	g	6/10 <u>P4D</u> fusion
1/5	12	Intermit	0	0	0	0	200"

All measurements are Δ ET. Diplopia is all uncrossed

SH - 1st ET surgery in her 20's

- LET 20 Δ , amblyopia 6/30 since childhood.
- Early recurrence of ET after Rs+Rc
- After 2nd surgery, straight with 'new' visual field in the temporal field of LE
- **Xed Diplopia on her L in her 'new' field**
- ARC only in her new field
- Diplopia resolved in 2 mo

Results – The Bad

- 3/12 patients had persistent diplopia after surgery with the longest follow-up being 4 yrs
- Youngest patient to complain of symptomatic diplopia was 8 yrs old – still persisting at 5 mo follow-up

Conclusion

- Most BUT NOT ALL patients with postop paradoxical diplopia due to ARC resolve after surgical alignment.
- Deferring alignment surgery to adulthood is a risk factor