

Childhood diplopia

How worried should you be?

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2 WORRIED DOCTORS



EVERY CHILD WITH DIPLOPIA
should make you feel uneasy every time

CORE Q: Is it a tumour? or is it 'trivial'?

- Is it a tumour?
- How can I be sure?
- MRI today? tomorrow?
- Is the child really OK,
manipulating the parents?
- **Will I miss something?**
- Will I frighten everyone **unnecessarily?**
- Will I be sued...be embarrassed?
- Will the child die if I don't act?



VERY FRIGHTENED MUM

Will this talk help you? Will the literature help?

What is the **selection bias**? =

Is your next patient similar to the ones I see?



- What does this child mean by 'double vision'?
- How can we tell if it's 'true' diplopia?
- Peppa asks: Does the eye Dr look inside your head?



Is it physiological diplopia, functional, attention seeking or a tumour ?

- It's not how well the child sees, it's how well the child *communicates*
- Is diplopia common in strabismus but not reported because it can't be verbalised by a child?



Has it always been there but never verbalised?

Duane's: demonstrating diplopia for the 1st time is common



- It is common for me to demonstrate diplopia for the first time in a 3+ year old with Duane's.
- The child always responds casually – has seen diplopia many times before but never mentioned it before.
- Parents always a little shocked.

Paediatric ophthalmology: Things that do not require referral

Clarke W.N., Paediatr Child Health. Sep 2005; 10(7): 395–396.

- DIPLOPIA ... can be quite alarming to parents but is most often the result of the child discovering physiological diplopia from crossing his or her eyes voluntarily.
- If the examiner can satisfy himself or herself that the child is describing physiological diplopia, referral can be avoided.

LK: after satisfying myself that there is no acquired strabismus, demonstrating phys dip to parents often relieves anxiety

Long-term Follow-up of Acquired Nonaccommodative Esotropia in a Population-based Cohort

Sarah Jacobs, Amy Green-Simms, Nancy Diehl, Brian Mohny

OPHTHALMOLOGY
2011; 118:1170-1174

30 year Mayo study

- 174 children were diagnosed during the 30yperiod, incidence of 1/287 live births.
- Median age at diagnosis for the 174 was 4 y(range, 10 mo to 18 y)
- ***Although 11% (8/75) of those queried were diplopic, none of the 174 was subsequently diagnosed with an intracranial lesion.***
- Diplopia is NOT a marker for CNS pathology

What do children mean by 'double vision'? (AG)

- AG, dob 3/07, intermitt XT since age 3.
- CR +3 OU. L XT 20, L XT' 25.
- March '14: LLR Rc 6mm, LMR plicate 5mm
- Day 1: L ET 8, EX'=0. 2 daddies when far away. Bilateral monocular **diplopiaBMD**.
- Day 13: straight D&N. 6/9 OU. 50". **BMD** still.
- Week 11: L XT 10. EX'=0. 6/9+ OU. 40". **BMD** still, not fixed by PH

What do children mean by 'double vision'? AG 2

- Week 20: XT recurrence a little worse. 6/9+ OU. 40". **BMD** still, not fixed by PH.
- Month 7: XT 12, X'20. 6/8, N3 OU. Stereo 25". RE: no diplopia. LE: still has monocular **diplopia**. HCL to L fixes diplopia, and stays OK when HCL removed.
- Month 8: **BM diplopia** again

Mum is beside herself

What do children mean by 'double vision'? AG 3

- Is this 'functional'?
- We can't get inside AG's head to understand what he means by 'double vision'
- Can someone have 'true' diplopia with 6/8, N3 OU & 25" stereo...sounds very improbable

How many scary studies?

Acute ET

- **1 Acute comitant esotropia in children with brain tumors.** Arch Ophthalmol. 1989 Mar;107(3):376-8. [Williams AS, Hoyt CS](#) n=6
- **2. Acute onset concomitant esotropia: when is it a sign of serious neurological disease?** BJO. 1995 May;79(5):498-501. [Hoyt CS, Good WV.](#)
- **3. Acute comitant esotropia: a sign of intracranial disease.** CanJ Ophthalmol. 1994 Jun;29(3):151-4. [Astle WF, Miller SJ.](#)

BUT: Acute ET in a 7 yr old with uncorrected R +2.5 6/6, L +3 6/9, 10Δ V, IOOA /SOUA, no lat incomitance, normal discs : very **unlikely** to have CNS pathology

Esotropia Greater at Distance

- *Children vs Adults*
- *Erin P. Herlihy, James O. Phillips, Avery H. Weiss*
- *JAMA Ophthalmol. 2013;131(3):370-375.*

Results: 15 children & 17 adults

- **93%** of children had underlying CNS disorder that coincided with the onset of their esodeviation*
- 24 % of adults had underlying CNS disorder.

**LK note: recurrent ET after BMR can be D>N with no CNS pathology*

Seattle ET, D>N

Table 1. Clinical Characteristics of Pediatric Subjects

Patient No./ Sex/Age, y	Medical History	Deviation, PD	
		Distance	Near
1/M/3	Arachnoid cyst, cystoperitoneal shunt	35 ET	15 ET
2/F/4	Varicella meningitis	25 ET	8 ET
3/M/5	NF-1, chiasmatic hypothalamic glioma	30 ET	14 ET
4/M/6	Transverse and sigmoid sinus thrombosis	28 ET	16 ET
5/F/7	NF-1, hydrocephalus	8 ET	0
6/M/8	Spina bifida, Arnold-Chiari malformation	20 ET	0
7/F/9	Medulloblastoma	25 ET	6 ET
8/F/10	Guillain-Barré syndrome	18 ET	0
9/M/12	Spina bifida, hydrocephalus	14 ET	0
10/M/13	Meningitis	16 ET	10 ET
11/F/13	Pilocytic astrocytoma posterior fossa	18 ET	8 ET
12/M/15	Viral meningitis	8 ET	1 E'
13/F/17	Guillain-Barré syndrome	20 ET	8 ET
14/M/18	Basal/sphenoid encephalocele	30 ET	20 E(T')
15/M/19	Sotos syndrome	12 ET	0

Diplopia per se is NOT the major/sole trigger for concern or panic: I have ONLY seen CNS pathology if there are other clues present

- Acute ET with no +
- 'Resistant amblyopia'

Acute ET with one of:

- Abnormal disc[s]
- Lateral incomitance

Conclusions: Diplopia in children

- Diplopia is probably under reported
- Children can use 'double vision' to mean something different to the way adults use those words
- 'Double vision' with no strabismus is probably of no concern
- Markers for possible CNS pathology include Acute ET and divergence insuff ET

Thank you

- Diplopia with no motility signs does not need an MRI

Stumped.....

- White-eyed blowout [n=1]

Helpful hints

- 1. check the disc carefully @ 1st visit
- 2. check the disc carefully if course is not what you expect eg 'resistant amblyopia'

I have NEVER seen intracranial pathology with a 'standard' strab that has diplopia

ET with hyperopia and some factor[s] that interfere with motor fusion eg

- SPA
- Oblique dysfunction
- Amblyopia

CHILDHOOD DIPLOPIA : IS IT SINISTER?

- Is that just myth & rumour?
- What will Dr Google tell the parents?