THE ROLE OF THE PAEDIATRIC CONTACT LENS SERVICE AT MREH

The management of infantile pseudophakia

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Presentation Outline

• Causes of paediatric aphakia

• Treatment options: Spectacles

Contact Lenses

Intraocular Lenses (IOLs)

• Survey of Pseudophakic Infants at MREH
Paediatric Aphakia

- **Congenital cataracts**
  - In UK 2.5-3.0/10,000 live births*
  - Associated disorders
    - Persistent Hyperplastic Primary Vitreous (PHPV)
    - Microphthalmos

- **Trauma**

- **Lens luxation**
  - Marfan syndrome
  - Ectopia Lentis

Treatment Options

Spectacles

• Advantages
  – Non-invasive
  – Well tolerated
  – Available in lenses up to +26.00DS
  – Increased magnification for near vision

• Disadvantages
  – Only suitable for bilateral aphakia
  – Thick and heavy lenses
  – Cosmetic issues
  – Optical issues relating to poor peripheral image quality
  – Easily removed!!
Treatment Options

Contact Lenses

• Advantages
  – Unilateral & bilateral aphakia
  – Full field of view
  – No optical distortion
  – Well tolerated
  – Custom made in a wide range of parameters

• Disadvantages
  – Invasive
  – Increased risk of infection
  – Parental stress over handling difficulties
  – Loss of lenses due to eye rubbing
  – Loss of magnification effect
Treatment Options

**Intraocular Lenses (IOLs)**

- **Advantages**
  - Reduce anisometropia in unilateral aphakes
  - Always provide partial optical correction
  - More closely simulate natural optics of the eye

- **Disadvantages**
  - Increased surgical adverse events
  - Visual axis re-opacification common*
  - May need additional surgery

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Survey of Pseudophakic Infants

Retrospective case note review

• All pseudophakic infants ≤ 6 months old fitted with a contact lens from Jan 2008 to Dec 2011 included

• Objectives:
  • To look at the age of infants at time of surgery
  • To determine initial refractive error and at 1 & 2 years of age
  • Type & specifications of contact lenses fitted
  • Development of visual function

• 17 infants identified: 6 bilateral
  23 eyes included
Results

Age at time of surgery

- Early surgery to minimize deprivation amblyopia*
- 57% operated within first 10 weeks of life

Results

Changes in refractive error

• **Aim** for hypermetropia initially to allow for axial elongation
  • *Infant Aphakia Treatment Study* aimed for +8DS under correction if operated on 4-6 weeks or +6DS if older than 6 weeks*

• Initial refractive error following surgery:
  Median +9.00DS (range: +7.00DS to +11.50DS)

• At 1 year of age:
  Median +3.00DS (range: plano to +8.00DS)

• At 2 years of age:
  Median +1.00DS (range: -3.00DS to +4.50DS)

Changes in Refractive Error

Initial Best Sphere Refraction & at 1 & 2 Years

- Initial refraction
- 1 Year
- 2 Years

Number of eyes vs Dioptres
Results

Contact Lens Management

• Lenses fitted as soon as possible following surgery
  • 70% fitted within 2 weeks

• All infants initially fitted with a high water hydrogel lens
  • K readings taken at time of surgery
  • Retinoscopy in clinic at time of fitting

• +2.00DS overcorrected for near point focus

• Optimum fit achieved with slight movement and optic of lens covering pupil at all times
Initial fitting of contact lenses

- Parents instructed on how to handle the contact lens
- Swaddle the child laying down
- Hand hygiene
- Decontamination/cleaning regime
- Importance of daily wear
  - 12 hours usual 7am to 7pm
- Information leaflet with emergency contact details
- Drops switched to preservative free
Results

• *Initial contact lenses selected:*
  - BOZR: 6.90mm to 9.00mm
  - Total diameter: 12.50mm to 14.50mm
  - BVP: +8.50DS to +16.00DS

• *At 1 year:*
  11 (48%) eyes still wearing a contact lens
  - BOZR: 7.40mm to 8.00mm
  - Total diameter: 13.50mm to 14.50mm
  - BVP: +5.00DS to +12.00DS

  12 (52%) eyes had discontinued lens wear
  - Did not require correction (plano to -2.00DS)
  - Corrected with spectacles (up to +5.00DS)

• *At 2 years:*
  - All eyes had discontinued lens wear
Development of visual function

- Visual acuity measured every visit by an orthoptist

- Initial acuity measurements with FCPL gratings recorded in cycles/degree

- If no response to FCPL acuity graded as ‘reacting to light’ ‘fixes & follows’ or ‘no interest’

- 61% of eyes measured using Cardiff Cards by 1 year

- By 2 years most infants assessed using crowded Kays and acuity recorded in LogMAR
Results

At 1 year:

- 78% achieved recordable visual acuity
  - 39% +0.60 LogMAR or better
  - 39% +0.70 to +1.50 LogMAR
- 22% of eyes were recorded as ‘perception of light’, ’fixes & follows’ or 'no interest'

At 2 years:

- 65% of eyes achieved acuity +0.10 to +0.60 LogMAR
- Of those, 43% achieved +0.30LogMAR or better
Visual acuity results

Visual acuity after initial contact lens fitting and at 1 & 2 years

- 2 Years
- 1 Year
- Initial Acuity

Number of eyes

LogMAR Visual Acuity

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2 2.1 2.2 PL Reacts to light No interest
Conclusions

- All infants initially left hypermetropic to allow for axial elongation

- Median refractive myopic shift: 1 year - 6.00DS
  2 years - 8.00DS

- 52% of eyes no longer required a contact lens by 1 year

- All infants initially fitted with hydrogel contact lenses from stock

- Silicon hydrogels now more commonly used - specification and availability better & cost has reduced

- Visual function: 43% of eyes achieved +0.30LogMAR or better by 2 years of age
Conclusions

• Contact lenses provide safe and effective optical correction of residual hypermetropia in pseudophakic infants

• They reduce the need for bulky spectacles – often readily removed by infants!

• Contact lenses particularly valuable in the early optical management of the anisometropia associated with unilateral pseudophakia
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