

A Cohort of High Hypermetropes with Esotropia How well do they do?

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Method

- 86 consecutive cases from private practice of strabismologist
- Retrospective audit
- High hypermetropia $\geq 6\text{DS}$
- With esotropia
- Progressive hypermetropia (change in refraction $\geq 1.5\text{DS}$)

Data

- Age of presentation
- Follow-up
- Visual acuities
- Best Stereopsis
- Refractive error (cycloplegic)
- Ocular deviation – esotropia & cyclovertical
- Surgery and response

Data

- N=86
- Follow-up
Mean 20.2 months (0-216)

High Hypermetropia in Literature

- Parks 1958
 - $143/897 = 16\%$ ($>5.25D$ & ET)
- Abrahamsson 1992 ($>5D$ & strabismus)
 - $2/49 = 4\%$
 - Progressive Hypermetropia
 - $5/41$ (Δ by 2-3D), $3/41$ (Δ by 1- $<2D$)
 - 41 with ET

1. Abnormal Accommodative Convergence in Squint, Parks, Archives in Ophthalmology, 1958;59 March

2. Refraction changes in childhood developing convergent or divergent strabismus, Abrahamsson, BJO 1992;76:723-727

Progressive Hypermetropia in Literature

- Abrahamsson 1992
 - Progressive Hypermetropia
 - 5/41 (Δ by 2-3D), 3/41 (Δ by 1-<2D)
 - 41 with ET (Range of Refractive Error?)
- Progressive hypermetropia in this study
 - 25/70 (36%)

Average Age of Presentation

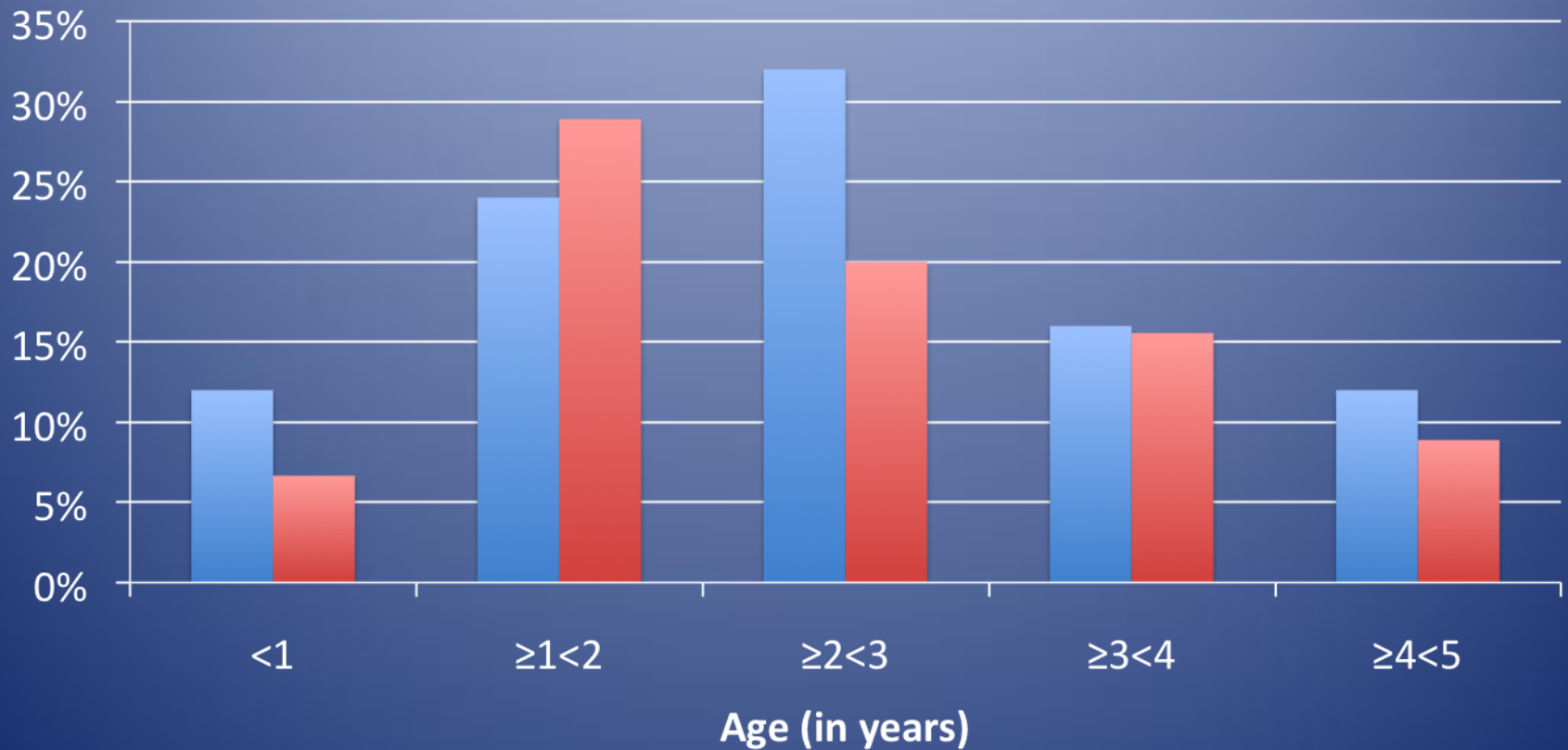
- 2.6yrs – this study
- Parks 1958 2.5yrs
- Abrahamsson 1992 2-3yrs

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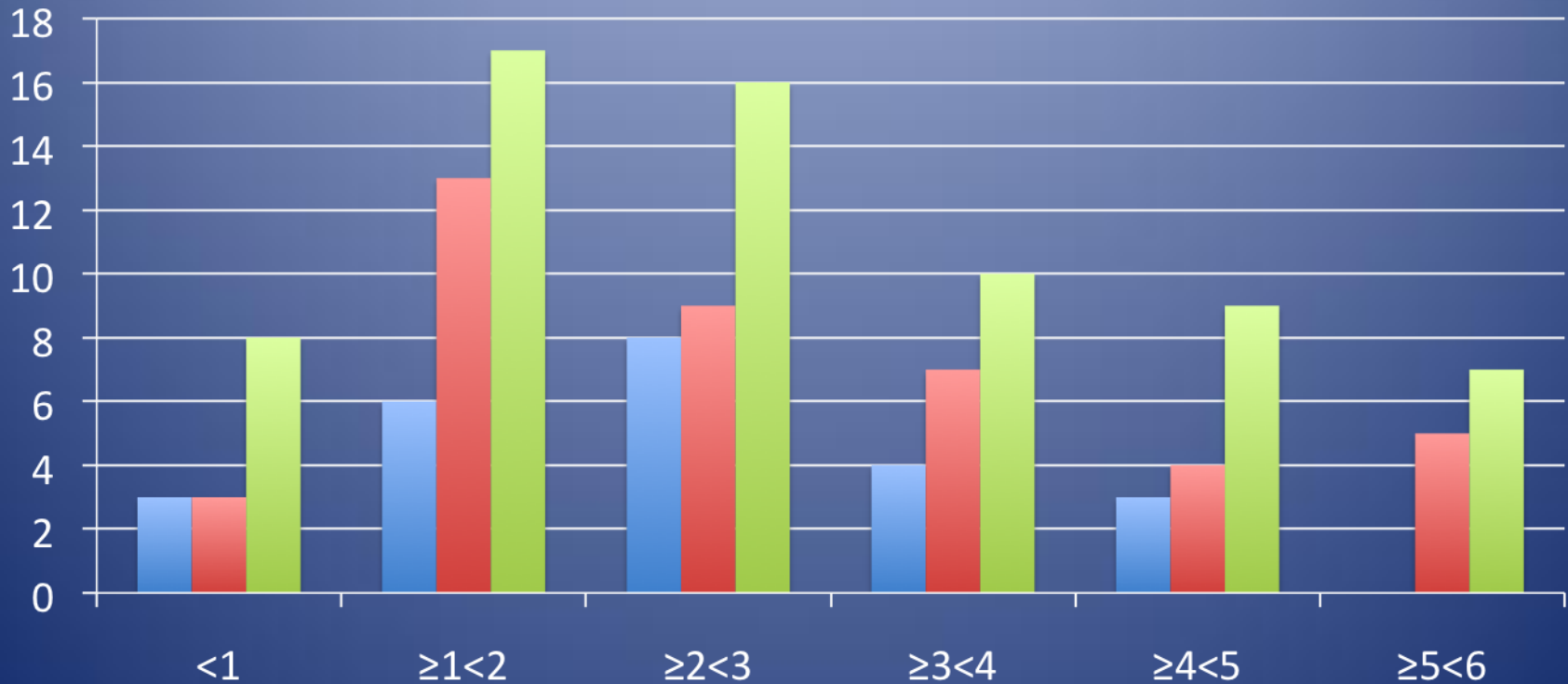
Age of Presentation (%)

■ Progressive Hyperopia ■ Non-progressive Hyperopia



Isoametropic Hyperopes Age of Presentation

Progressive Hyperopia Non-progressive Hyperopia
Isoametropic Hyperopes



Isoametropic Hyperopes

Age of Presentation

- Isoametropic Hyperopes present later
- Klimek – 5yrs 1mo vs 3yrs 5 mo (all hyperopes)
- Ziylan – 5.5 yrs vs 4.1 yrs (all hyperopes)
- Not in this study
 - Majority before age 3

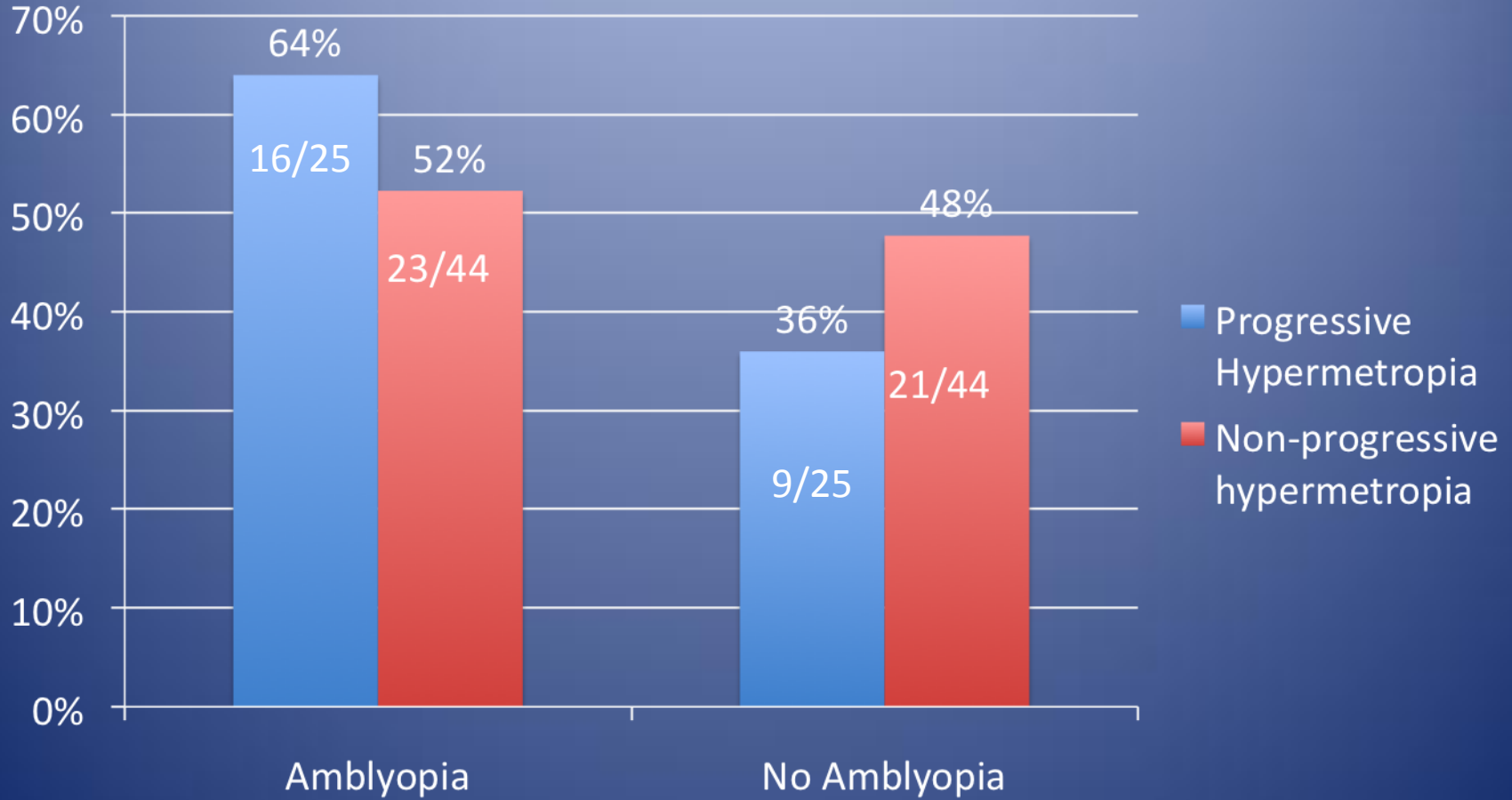
High Hyperopes & Amblyopia

- Bilateral amblyopia ($\leq 6/12$)
 - 18% this study
 - 9% - Klimek ($\geq 4.5D$, no anisometropia $\geq 1.5D$)
- Responded well to Rx – glasses & patching
- After Amblyopia Rx – achieved $> 6/12$
 - 86% - Klimek ($\geq 6/12$)
 - 83.9% - Ziylan
 - 83% - this study

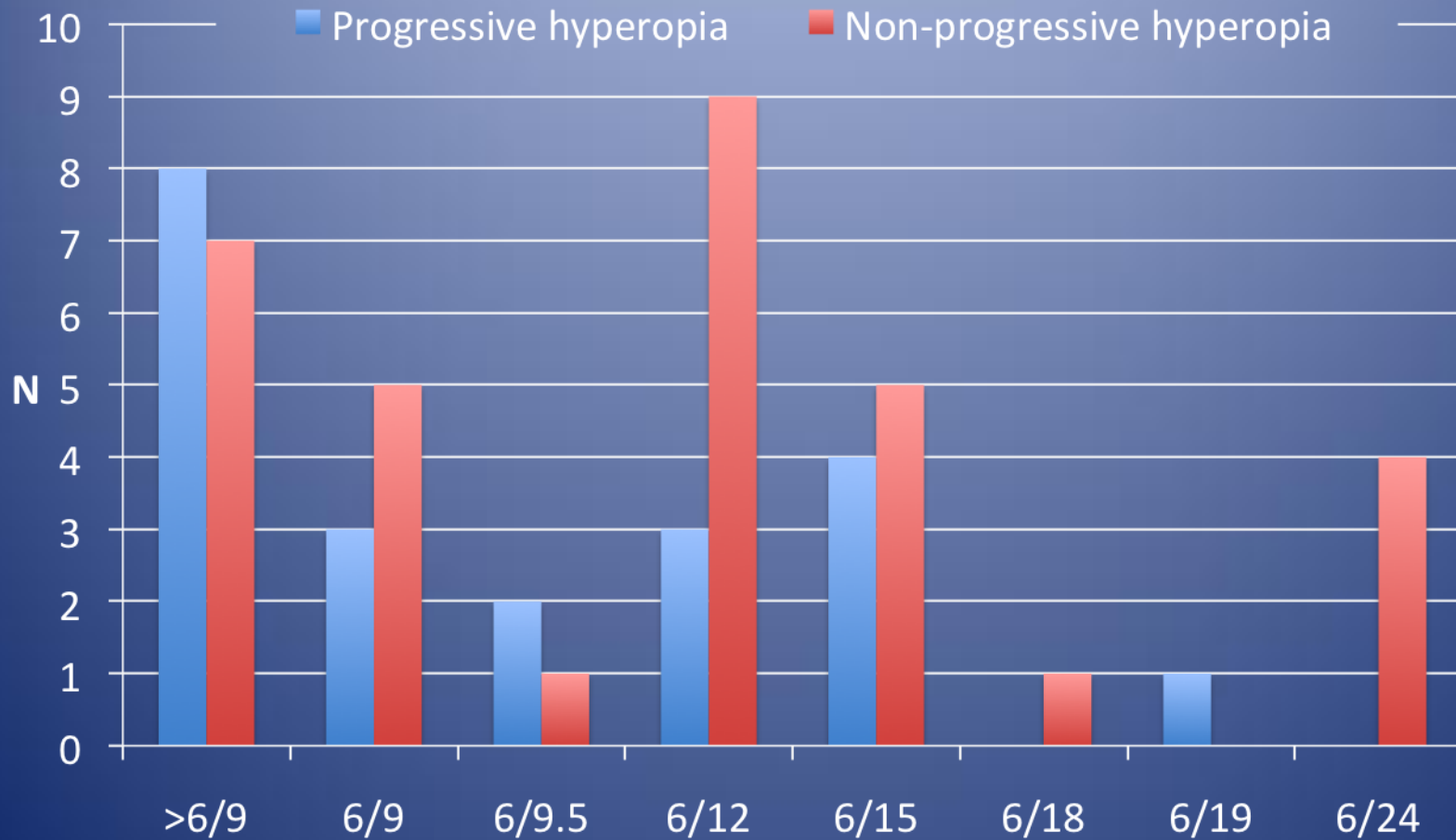
BCVA in better eye

- $VA \geq 6/7.5$
 - 23/60 (38%) – this study (higher hypermetropia, $\leq 1.5D$ anisometropia)
 - 58% Klimek ($\geq 5D$, $\leq 1.5D$ anisometropia)
- Overall do high hypermetropes do worse?

Progressive Hypermetropes & Amblyopia

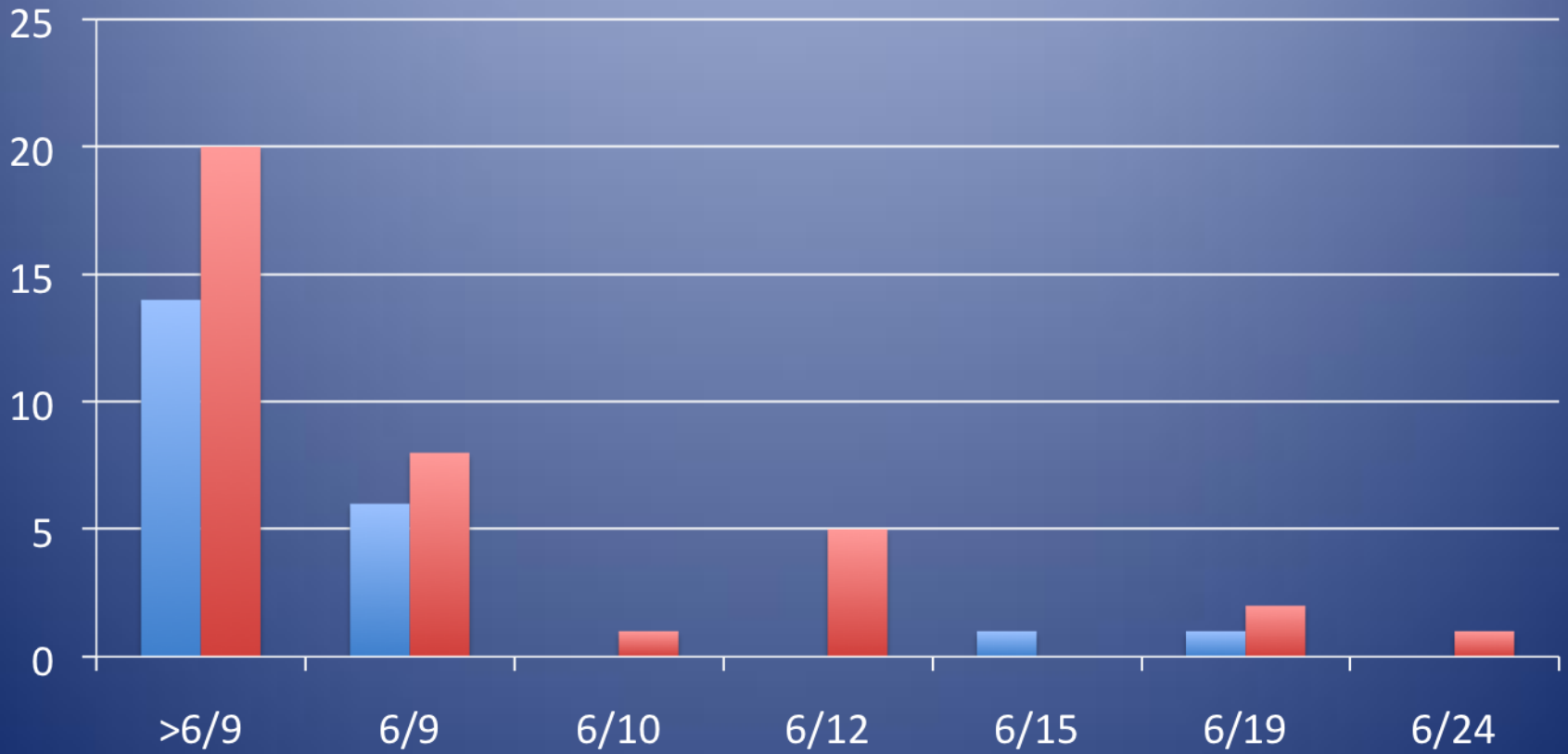


Progressive Hypermetropia & BCVA in worse eye



BCVA better eye

■ Progressive hyperopia ■ Non-progressive hyperopia

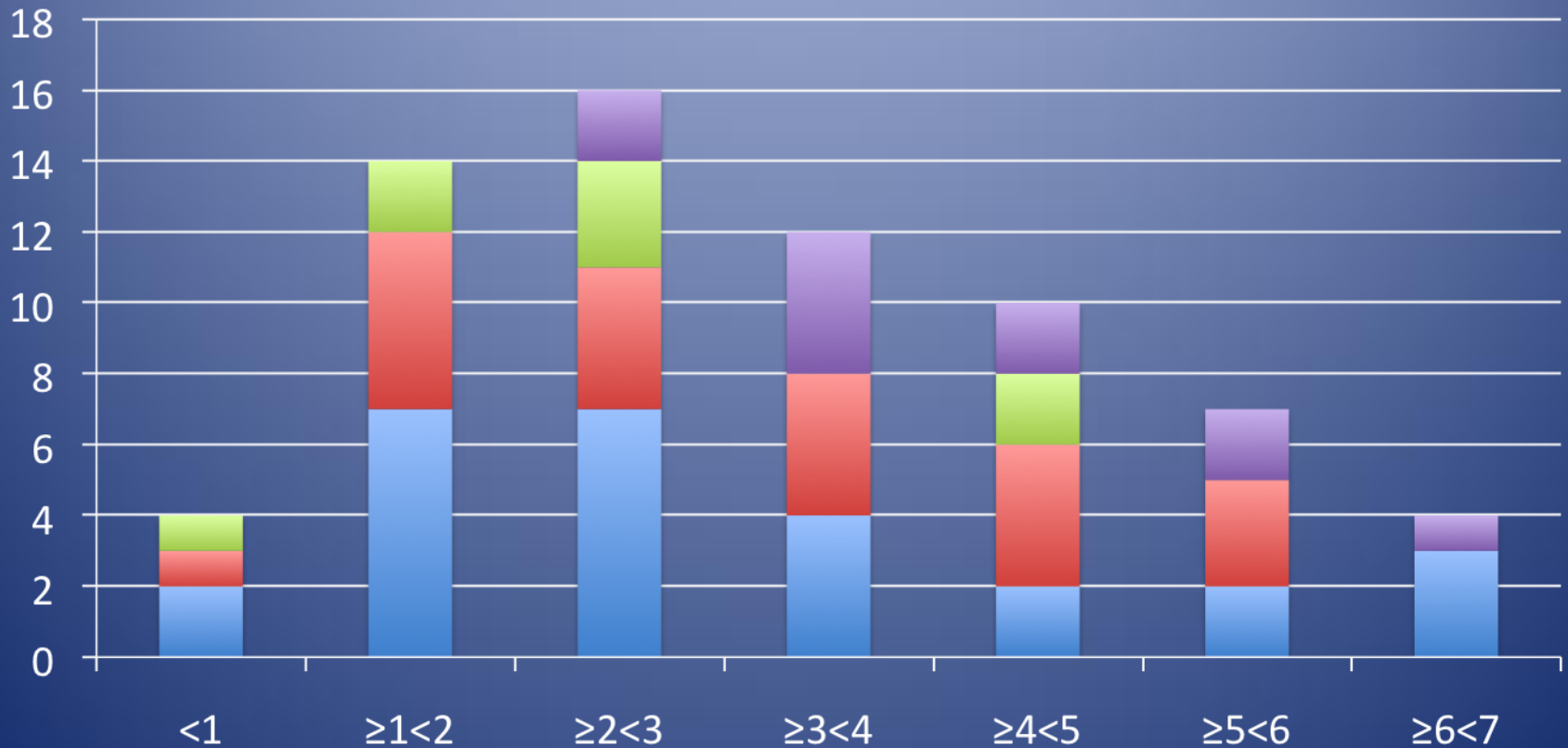


Stereopsis

- No difference between progressive hyperopes and non-progressive hyperopes

Age of Presentation & Best Sensory Fusion

■ No Stereopsis ■ 4dot ■ FLY ■ 200"-25"



Stereopsis

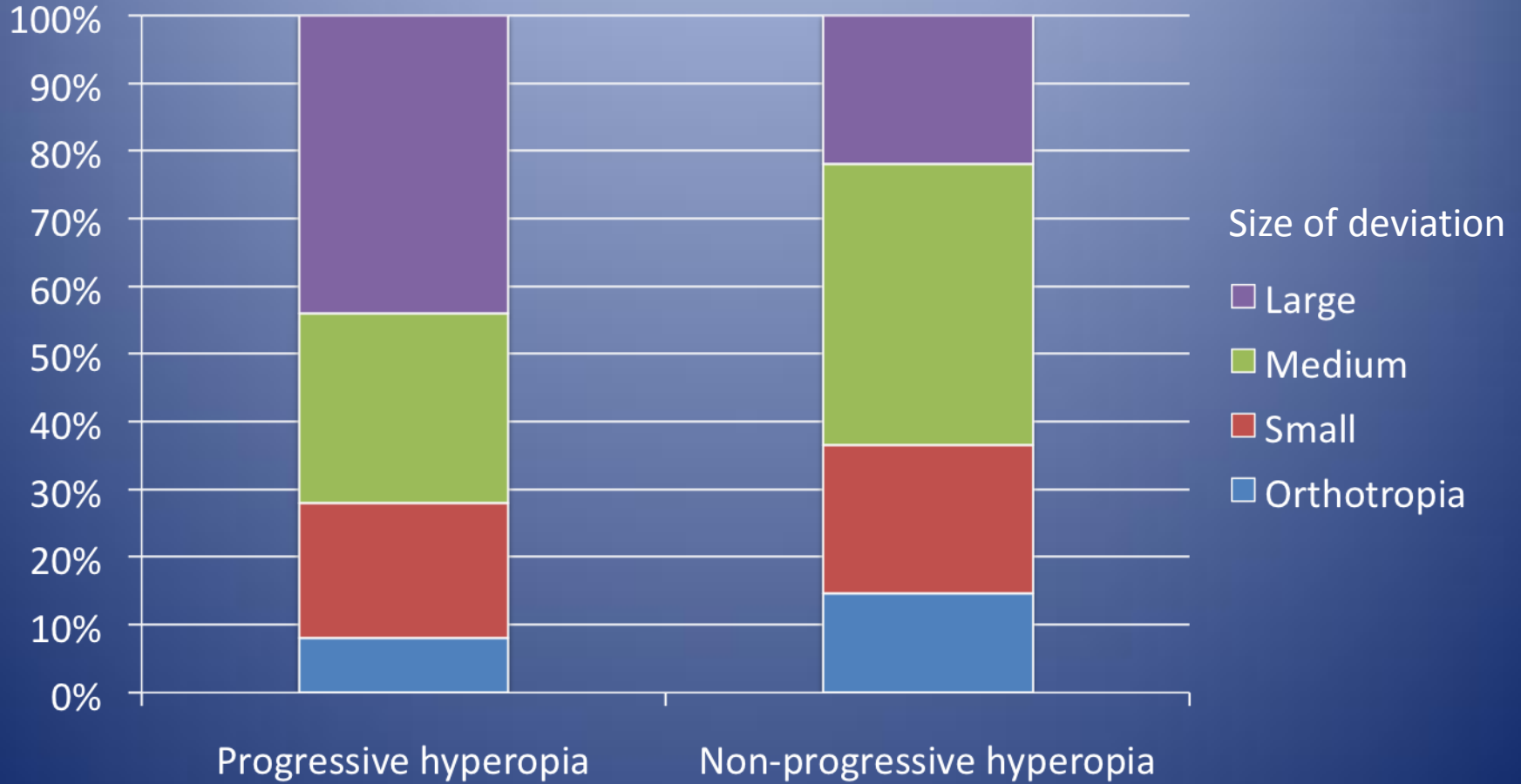
- Higher levels of stereopsis found in those who presented later
- (rather than early detection and Rx)

% with stereopsis

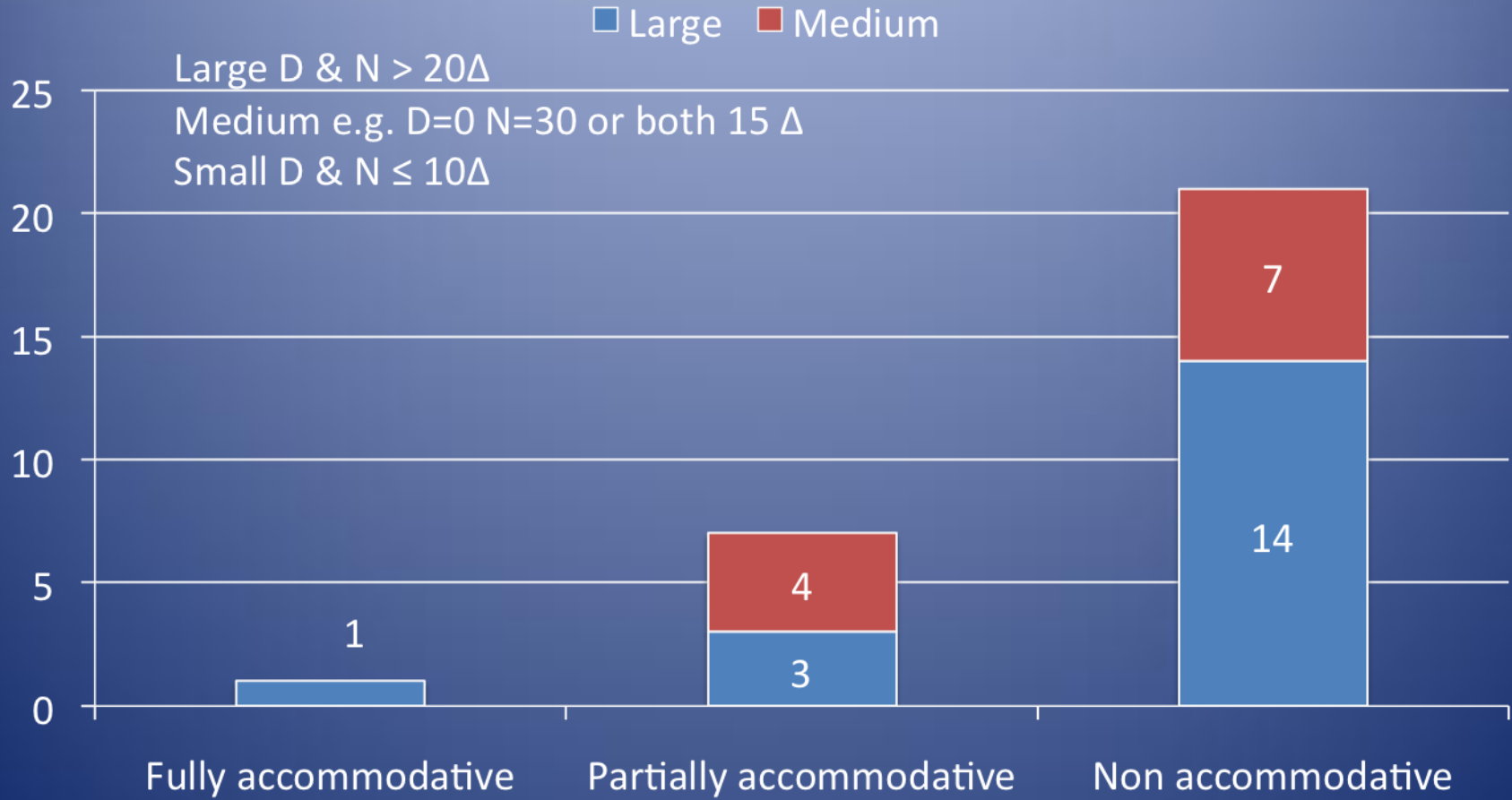
- 89.3% - Mulvihill (range of hyperopia uncertain)
- 33% - this study

Outcome in refractive accommodative esotropia, Mulvihill et al, BJO 2000; 84:746-749

Progressive Hyperopes & Esotropia



Surgery & Size of Deviation

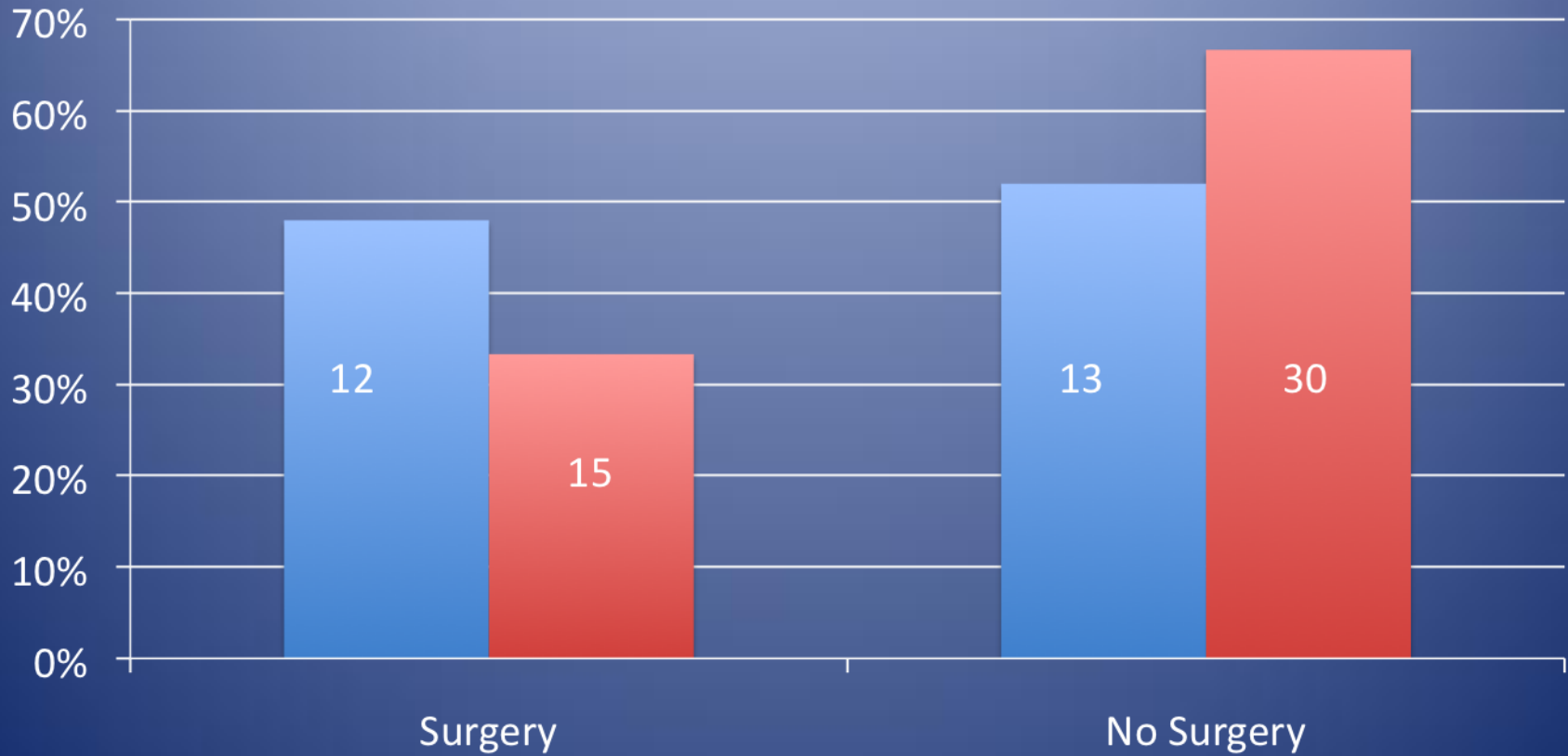


Surgery in fully accommodative ET

- Decompensation of fully accommodative ET
 - 2.4% requires surgery (Mulvihill)
 - $1/40 = 2.5\%$ (this study)

Progressive Hyperopes & Surgery

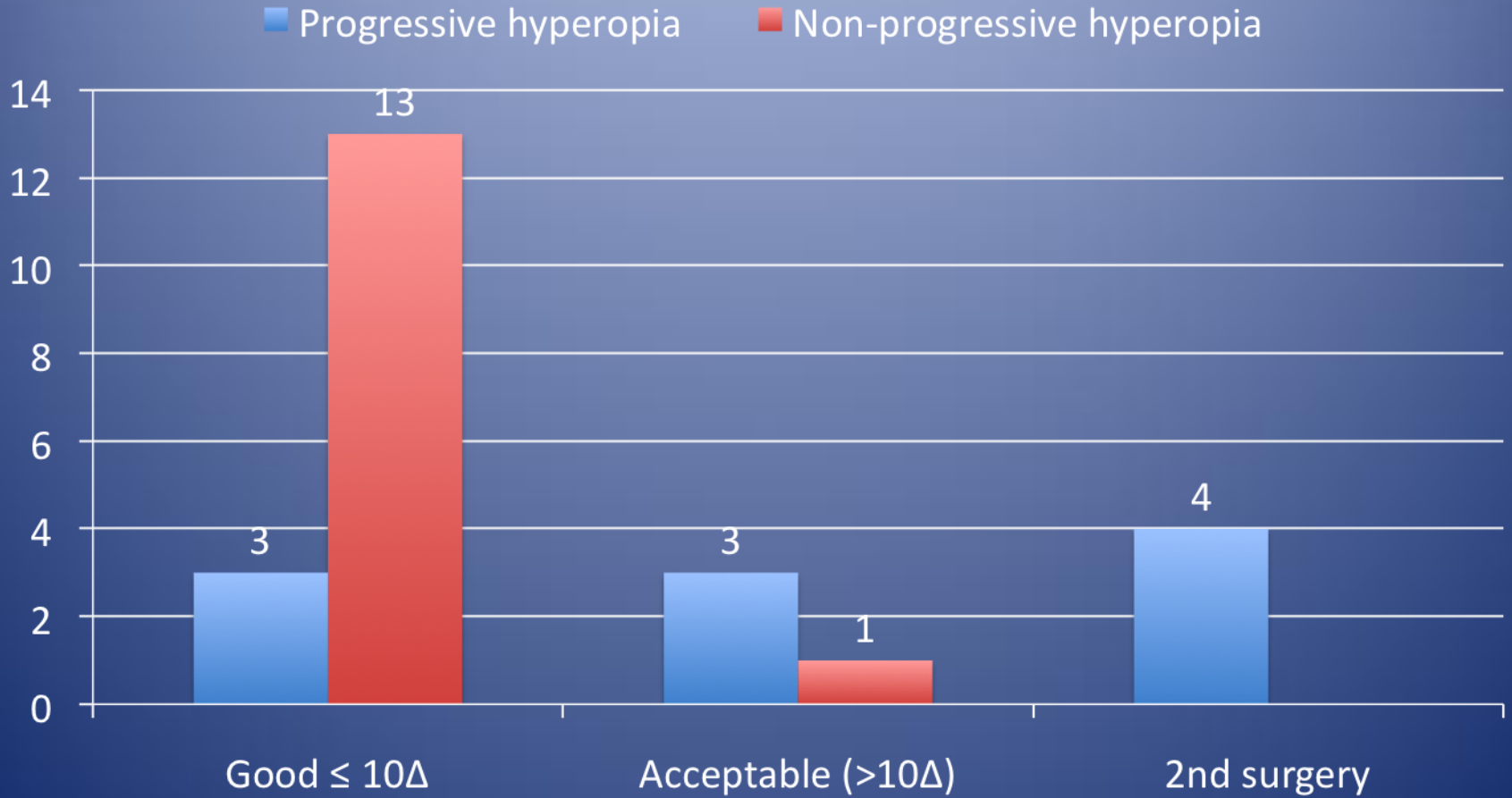
■ Progressive hyperopia ■ Non-progressive hyperopia



Surgery

- Rate 30/85 (35%)
 - 1 Operation: 24
 - 2 Operations: 5
 - 3 Operations: 1
 - Reoperation rate 6/24 (25%)
- Reoperation rate of surgeon
 - BMR 10%
 - <2yrs old 15%,
 - Difficult group (consecutive XT) 16%

Surgery results



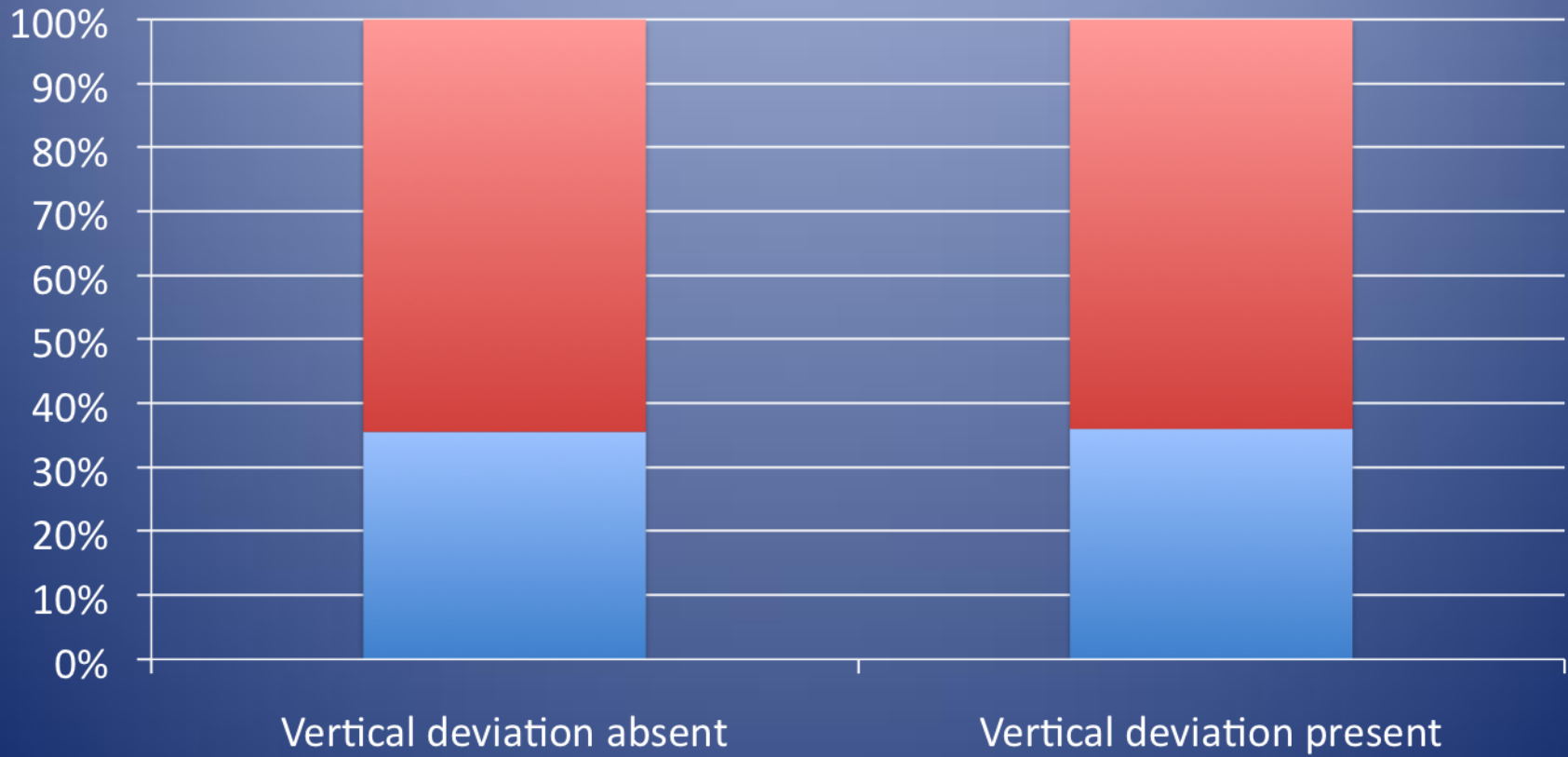
Results for 6 patients unknown

Cyclovertical Anomaly

- N=86
- Present 32 (37%)
- None 54 (63%)

Cyclovertical anomaly

■ Progressive hyperopia ■ Non-progressive hyperopia



Differences between $\geq 6\text{DS}$ & ET vs $< 6\text{DS} \pm \text{ET}$

- 36% Progressive hypermetropia
 - More common with high plus
- Bilateral amblyopia – higher risk
- Sensory fusion seen if presenting age $\geq 2\text{yrs}$
- Reoperation rate 25%

Progressive vs Non-progressive hypermetropia

Progressive hypermetropes more likely to

- Have amblyopia - But responds well to Rx
- More likely to have larger angle ET
- More likely to require surgery
- Less likely to have good results
 - Progressive hyperopes – not well reported in literature