



Large-angle Strabismus in Adults

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**EGYPTIAN
OPHTHALMOLOGICAL
SOCIETY**
EQS 2023



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What are the concerns in the
management?

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Can a single surgical procedure
achieve a successful outcome?

2

Why adults nowadays are
seeking correction?

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What is considered large angle
strabismus?

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Large-angle Horizontal Strabismus

- Definition is variable in the literature.
- Studies have used a cut-off ranging from **40-60 PD**.
- 1ry / 2ry / consecutive.
- The current surgical tables in various references providing the amount of surgery are established up to 50 D in XT, 70 D in ET.
- Variable success rate between 40% and 89% across studies.

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Why adults nowadays are seeking correction?



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Impact of large angle horizontal strabismus on ability to obtain employment

D K Coats et al. Ophthalmology, 2000 Feb.

Conclusions: Large angle horizontal strabismus appeared to be vocationally significant for female applicants, reducing a strabismic female applicant's ability to obtain employment. The presence of strabismus did not appear to influence hiring decisions of male applicants.

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Aim of Surgical correction

- ✓ to achieve optimum eye alignment with one operation.
- ✓ improving patient's psychosocial functioning.
- ✓ restoring binocular vision, in some cases.
- ✓ avoid troublesome postop diplopia or symptomatic side-gaze incomitant deviations.

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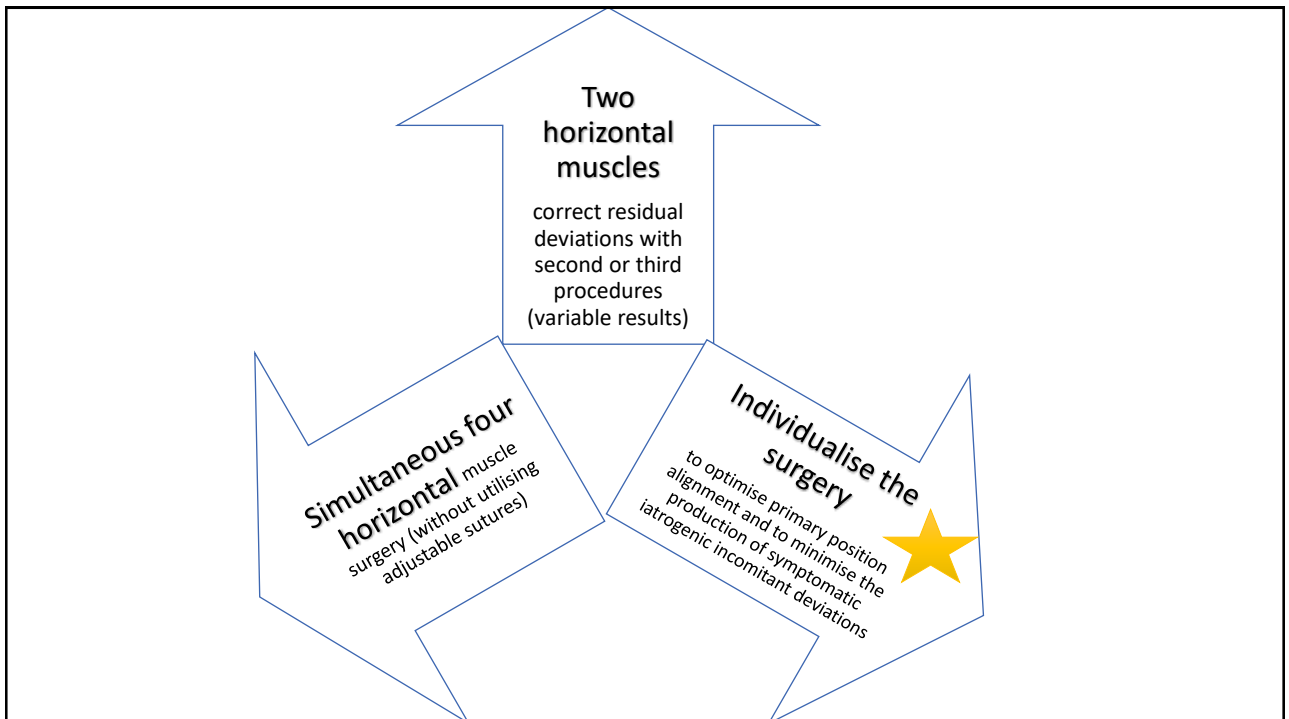
Can single procedure be enough?



The number of muscles operated on is dependent on:

- Degree and density of amblyopia.
- Size of the deviation.
- Predicted functional significance of inducing significant lateral incomitance.
- Previous surgery.
- Any abnormality of ocular movements.

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Individualise the surgery

- Reported approaches include doing large surgeries on two horizontal rectus muscles.
- operating on three horizontal rectus muscles (putting all of them on adjustable).
- dividing a surgical amount of 18–19 mm into three rectus muscles.
- recessing two horizontal rectus muscles in both eyes by a specified amount and adding a third or fourth rectus muscle based on surgical tables/dosing formulated by the surgeon.
- dividing the deviation by two to decide the surgical dosing for one eye and doing the same in the fellow eye.

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Two horizontal muscles



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Three-Four muscles



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Concerns in Management

- Binocularity restoration
- Orthophoria
- Cosmesis
- The target angle based around the smaller angle, with near-distance disparity.
- FDT
- Adjustable sutures; Single-stage adjustable strabismus surgery (SSASS)
- Botulinum toxin
- Surgical success was defined as 10-15D or less of heterophoria/heterotropia for distance
- risk of symptomatic postoperative diplopia
- Narrowing of the field esp in XT.
- Long-term follow up
- Reoperation
- Age group is not a factor for positive outcome .

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Large-angle Exodeviations

- The management falls broadly into two surgical approaches.
 - Large OU LR recessions when the acuity is good in each eye, (\pm obliques).
 - A maximal or supramaximal unilateral RR if one eye was amblyopic.
- Spreading the surgery over three or four of the horizontal recti produces a high degree of side-gaze ocular movement.

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Large-angle Esotropia

- more than 50 D in primary position.
- Augmentations such to increase the effect of recession; as Botox injection to recessed muscle, tenectomy and the medial rectus elongation with different techniques.
- One-stage surgery on three muscles, supra large bilateral medial rectus recession and unilateral recession/resection have gained popularity in comparison to other types.
- Surgical doses adjustment is based on three clinical factors:
 - 1) the size of the globe
 - 2) Forced duction test (FDT) of MR
 - 3) The amount of RR was decreased with simultaneous weakening surgery on IO muscle.
- A calculated dose-response ratio of 3.79-4.1 for every mm of recession or resection in patients undergoing three-muscle surgery can be used as a guide.

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Large-angle esotropia



Garrity et al. J AAPOS. 2019

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To summarize

- Where the psychosocial consequences are the main indication for seeking surgery, the aim is to optimise eye alignment with the minimum number of surgical interventions.
- Tables for strabismus correction are designed for two muscle surgery, for deviations of ≤ 55 PD, two horizontal rectus muscles, and for >55 PD, three rectus muscles were operated.
- In adults, Adjustable suture surgery involving three or more horizontal recti successfully restores primary position alignment, a high degree of patient satisfaction, and can be expected to be associated with a low incidence of symptomatic postoperative incomitance.
- The lack of comparison of surgical methods and different follow-up periods, makes the results variable.
- Large-scale studies validating the surgical dosage for three and four muscle surgery.

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