PAEDIATRIC FACIAL PALSY AND RE-ANIMATION SURGERY

Richard Theile

MCH and RCH
Brisbane

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Childhood Facial Palsy - Classification

- Congenital
  - Unilateral / Bilateral
  - Complete / Incomplete
  - Syndromic / Non-syndromic
- Acquired
  - Tumour
  - Trauma
  - Iatrogenic
  - Post viral
  - Bell's
  - Miscellaneous

Childhood Facial Palsy - Classification

- Congenital
  - Simple (isolated VII nerve)
    - Greatest effect upper lip and commisure
  - Complex (associated regional anomalies)
    - Unilateral – Hemifacial
    - Bilateral - Moebius

Childhood Facial Palsy - Aetiology

- Congenital results from developmental problems in early gestation
  - Failure of VII nerve development
  - Failure at brainstem/ nucleus level
  - Regional muscular agenesis/ hypoplasia
- 'Acquired congenital' refers to the rare intra partum injury (forceps)

Childhood Facial palsy

- Non-syndromic
  - Usually unilateral
  - Complete / Incomplete
- Syndromic
  - Moebius
  - Hemi facial microsomia

Childhood Facial palsy

- Syndromic
  - Moebius
    - Bilateral usual
    - VI and VII nerve palsies
    - Other cranial nerves can be involved (9,10,12)
    - Craniofacial anomalies possible
    - Upper and lower limb anomalies possible
      - Talipes, Poland's, Syndactyly,
    - Lower face may be spared

Childhood Facial palsy

- Syndromic
  - Moebius
    - No clear pathogenesis
    - Embryonic vascular disruption favoured
    - Other theories
      - Genetic inheritance in a few cases reported

Childhood Facial palsy

- Syndromic
  - Hemi-facial microsomia
    - OMENS classification
    - Unilateral more common
    - Other anomalies often more striking than VII nerve
    - Exam - remember to analyze VII nerve function and comment
    - Other reconstructive priorities not just re-animation
      - Mouth, ear, eye, skeleton, soft tissues
      - Small group only
      - Complex decisions required as to priorities

Childhood Facial Palsy

- Surgical options less diverse than adults
- Eye problems minimal
- Oral continence usually OK
- Static procedures rare
- Dynamic reconstructions usual

Childhood Facial Palsy

- Early childhood show no awareness of being different
- Psychosocial development is usually normal
- Awareness and concerns appear variable time
- Usually preschool/ early school
- Functional problems more severe in acquired palsy
  - Corneal protection
  - Speech and oral continence
  - Interpersonal communication

Childhood Facial Palsy

- General approach
  - Early review and counseling
  - Indicate condition and prognosis
  - Lay out treatment options and timing
  - Review early and often if eye problems
  - Review around age 4
  - Surgery at age 5-6

Childhood Facial Palsy

- Timing
  - Eye exposure needs urgent/ semi-urgent treatment
  - Rare to need this

Ocular management - Uncommon

- Corneal exposure – Lubricants or taping
- Lagophthalmos – Gold weights
- Lower lid procedures – rarely needed in kids
- Brow ptosis – rarely needed in kids
- Epiphora – DCR or Botox to lacrimal gland

Childhood Facial Palsy

- Timing
  - Muscle transfer at early school age
  - Improve self esteem
  - Reduce teasing
  - Improve cerebral plasticity/integration of facial movement
  - Age when the child can self rehabilitate

Childhood Facial Palsy

- Congenital palsy require both nerve and muscle to be introduced
- Nerve options
  - Cross facial graft
  - Masseteric nerve
  - Other – XII, XI
- Muscle options
  - Gracilis
  - Other – Lat Dorsi, Pec Minor, ECRB, Serratus

Childhood Facial Palsy

- Results not perfect or symmetric
- Superior to static procedures

Childhood Facial Palsy

- Muscle transfer
  - Can
    - Provide better symmetry at rest
    - Provide upper lip and commissure movement
    - Grow with the child and maintain result
  - Can't
    - Provide absolute symmetric/ spontaneous movement
    - Provide fine variation of movement
    - Provide reanimation to forehead, eye or lower lip

Childhood Facial Reanimation Personal Approach

1 Stage gracilis transfer to masseteric nerve

- 'Variable' results noted for cross facial nerve graft
- Poor excursion in cross facial graft
- Potential diminution of normal side function

Childhood Facial Reanimation Personal Approach

1 Stage gracilis transfer to masseteric nerve

Advantages

- Short time to movement (6-9 weeks)
- Excellent excursion/ movement
- Reliable/repeatable results
- Single stage

Childhood Facial Reanimation Personal Approach

1 Stage gracilis transfer to masseteric nerve

- Axons in cross section
  - Masseteric nerve – 1500
  - Cross facial graft – 150
  - Obturator nerve – 350

Childhood Facial Reanimation Personal Approach

1 Stage gracilis transfer to masseteric nerve

- Disadvantages
  - Requires learning and cerebral plasticity to gain best results
  - Less likely spontaneous movement
  - Movement on mastication

Unilateral Childhood Facial Reanimation – Exam answer

- Unilateral
  - Normal contralateral VII nerve
    - Cross facial nerve graft
    - Second stage muscle transfer

Unilateral Childhood Facial Reanimation – Exam answer

- Unilateral
  - Normal contralateral VII nerve
    - Intra-operative selection of appropriate buccal branch donors
    - Alternative branches remain to cover function

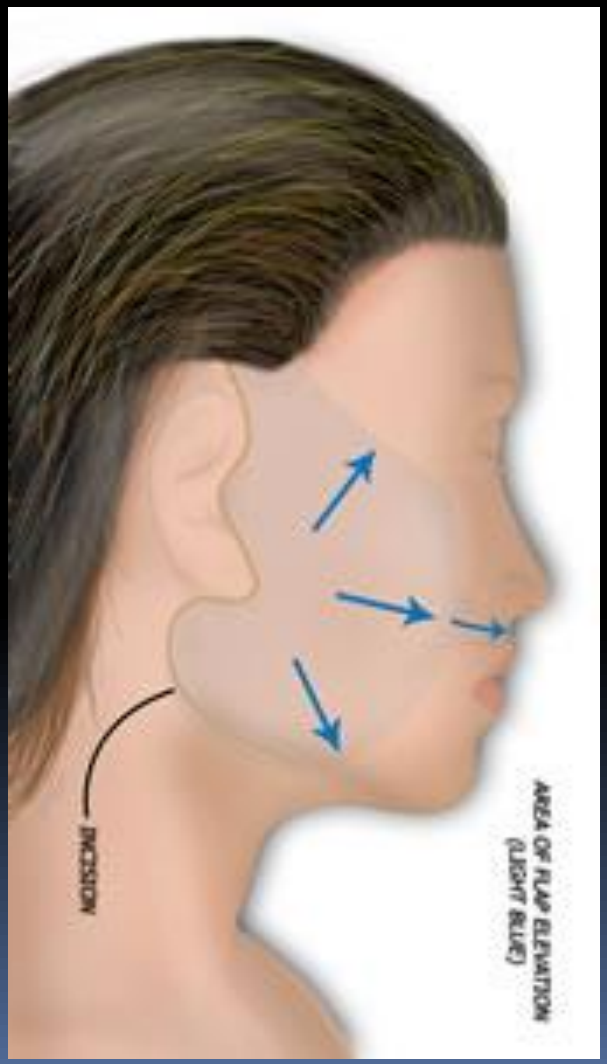
Unilateral Childhood Facial Reanimation – Exam answer

- 2 stage reconstruction
  - Cross facial nerve graft to upper lip sulcus
  - Two buccal branch donors
  - Gracilis second stage to facial nerve in sulcus
  - Facial vessels

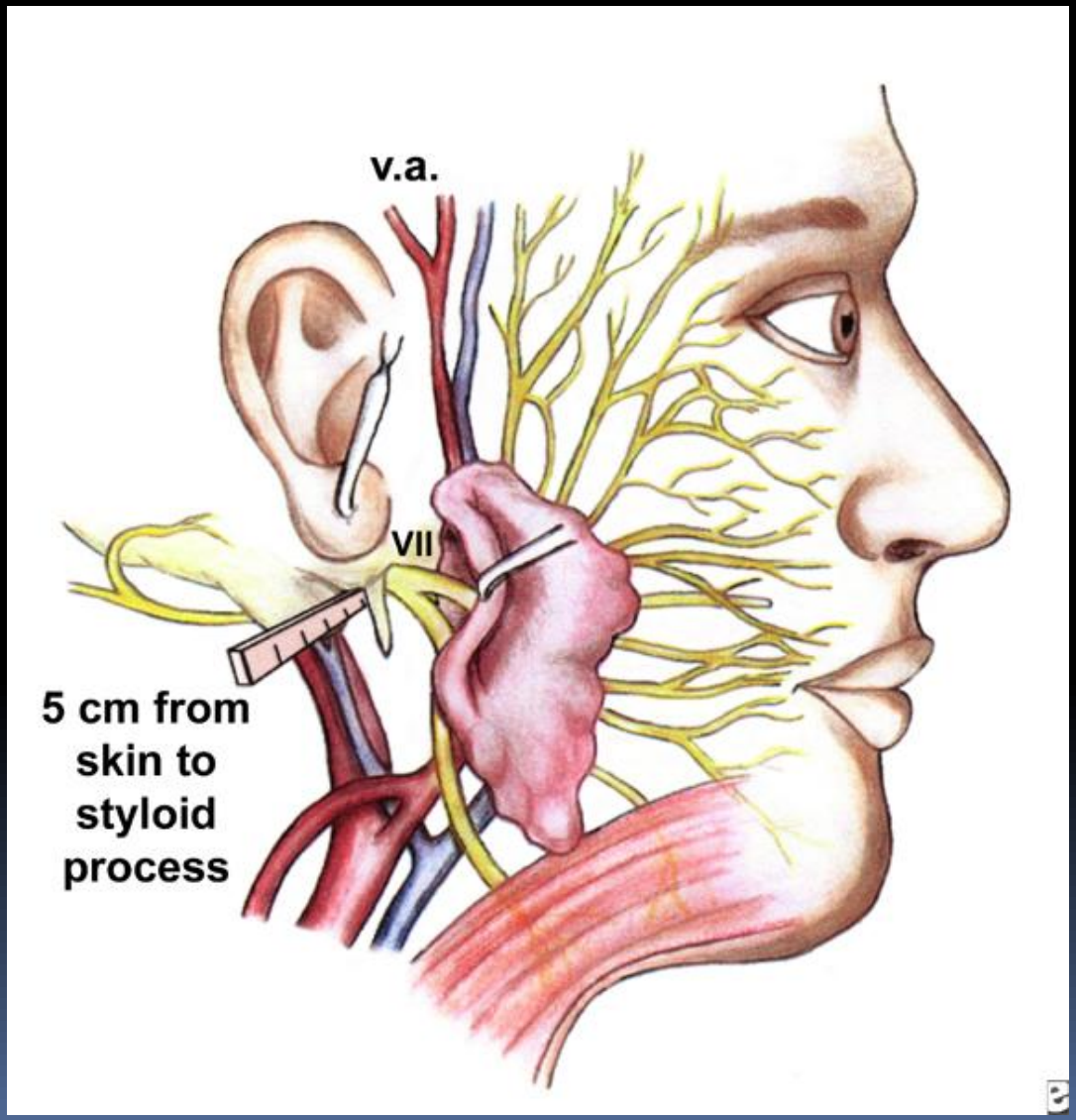
Unilateral Childhood Facial Reanimation – Exam answer

- Cross facial nerve graft
  - Face lift type incision
  - Branches identified on exit from anterior parotid
  - Nerve stimulator to map branch innervation
  - 2-3 branches used as long as their function is covered by other branches
  - Sural nerve graft tunneled and banked in contralateral upper lip sulcus via sulcus incision
  - Tagged
  - Regeneration monitored by Tinel's sign
  - 2ND stage at 9-12 months

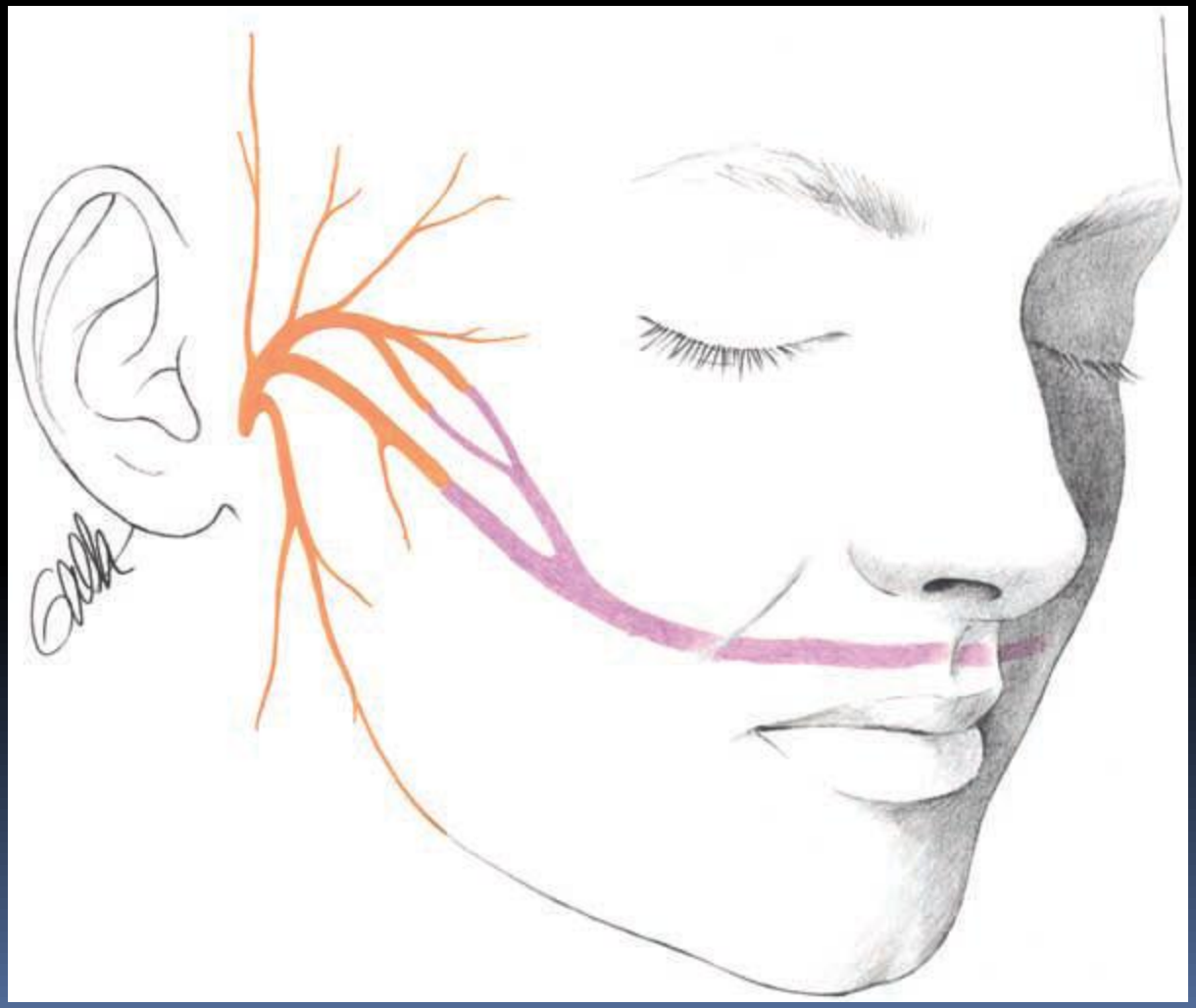
Facial Reanimation Surgery



Facial Nerve

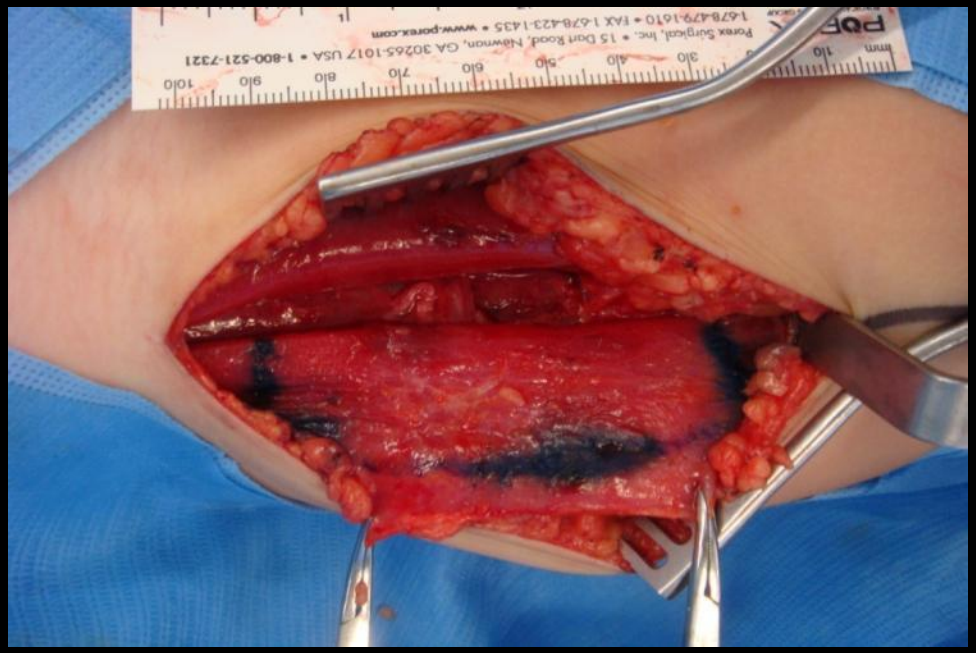


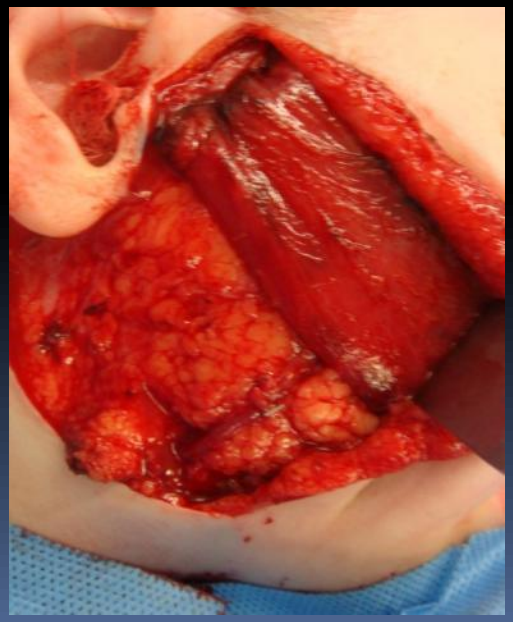
Sural Nerve Graft

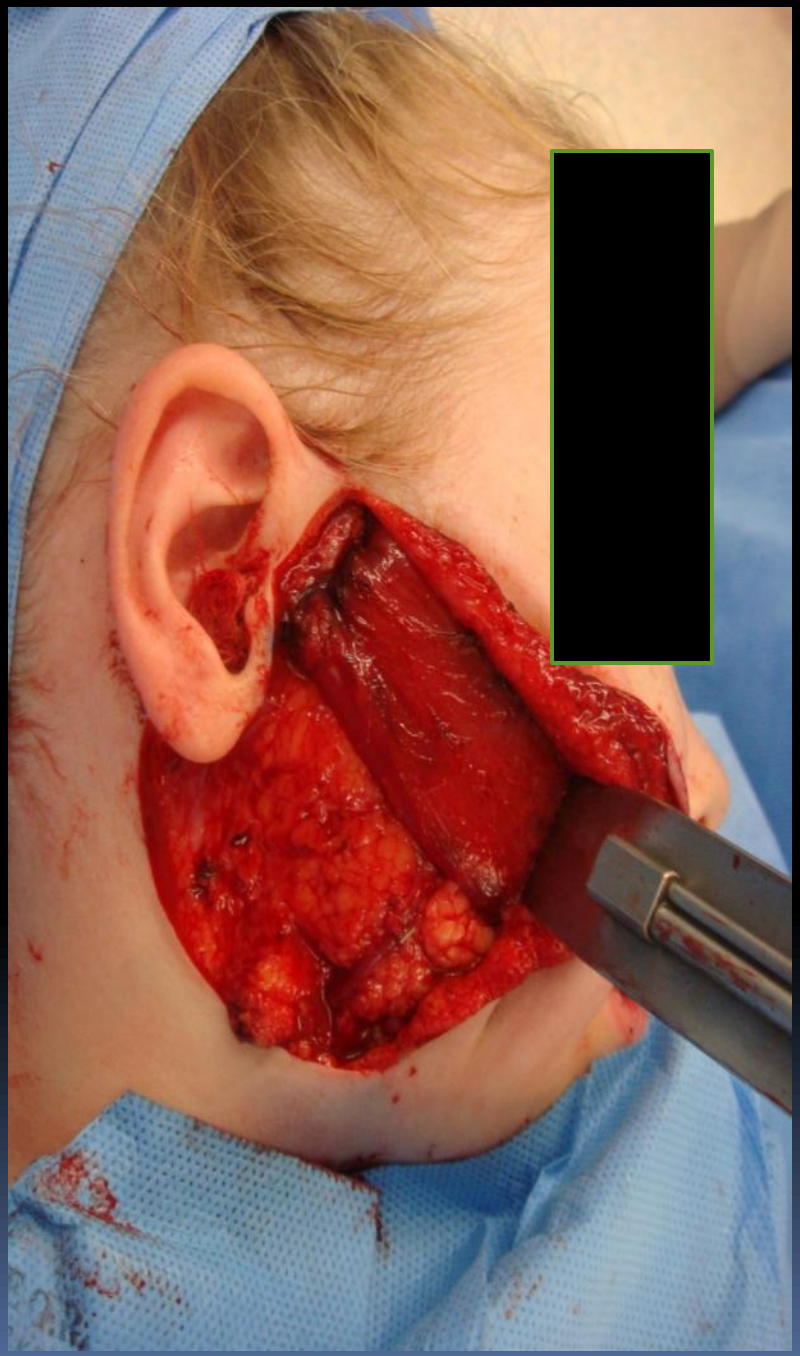


Unilateral Childhood Facial Reanimation – Exam answer

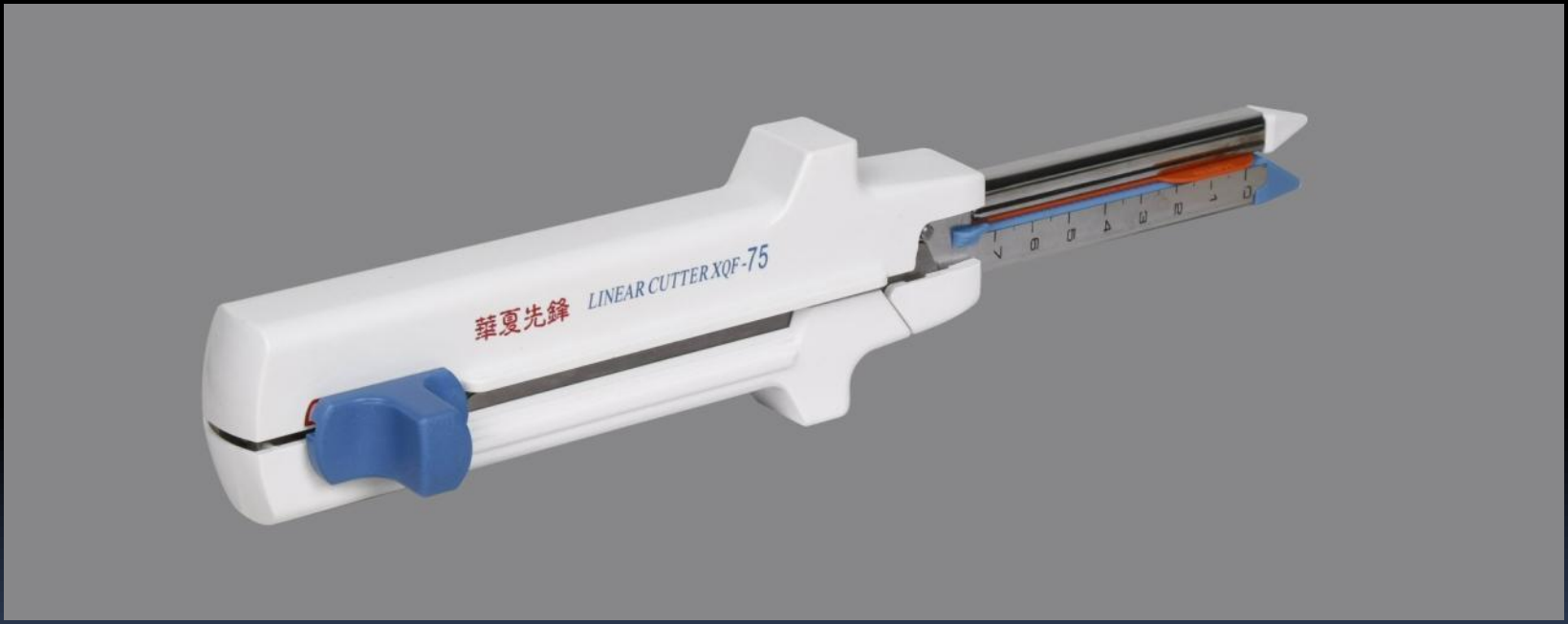
- Muscle transfer
  - Segmental Gracilis
  - Selective Obturator nerve branch
  - Vector to replicate smile on normal side
  - Suture to upper lip and commissure +/- lower lip
  - No slip suture technique
  - Correct tension/ length
  - Facial vessels via preauricular and neck incision
  - Cross facial graft via upper buccal sulcus incision







GIA Stapler



Unilateral Childhood Facial Reanimation – Exam answer

- Unilateral
  - Abnormal contralateral VII nerve
  - Intra-operative selection - not appropriate buccal branch donors
  - No alternative branches remain to cover function

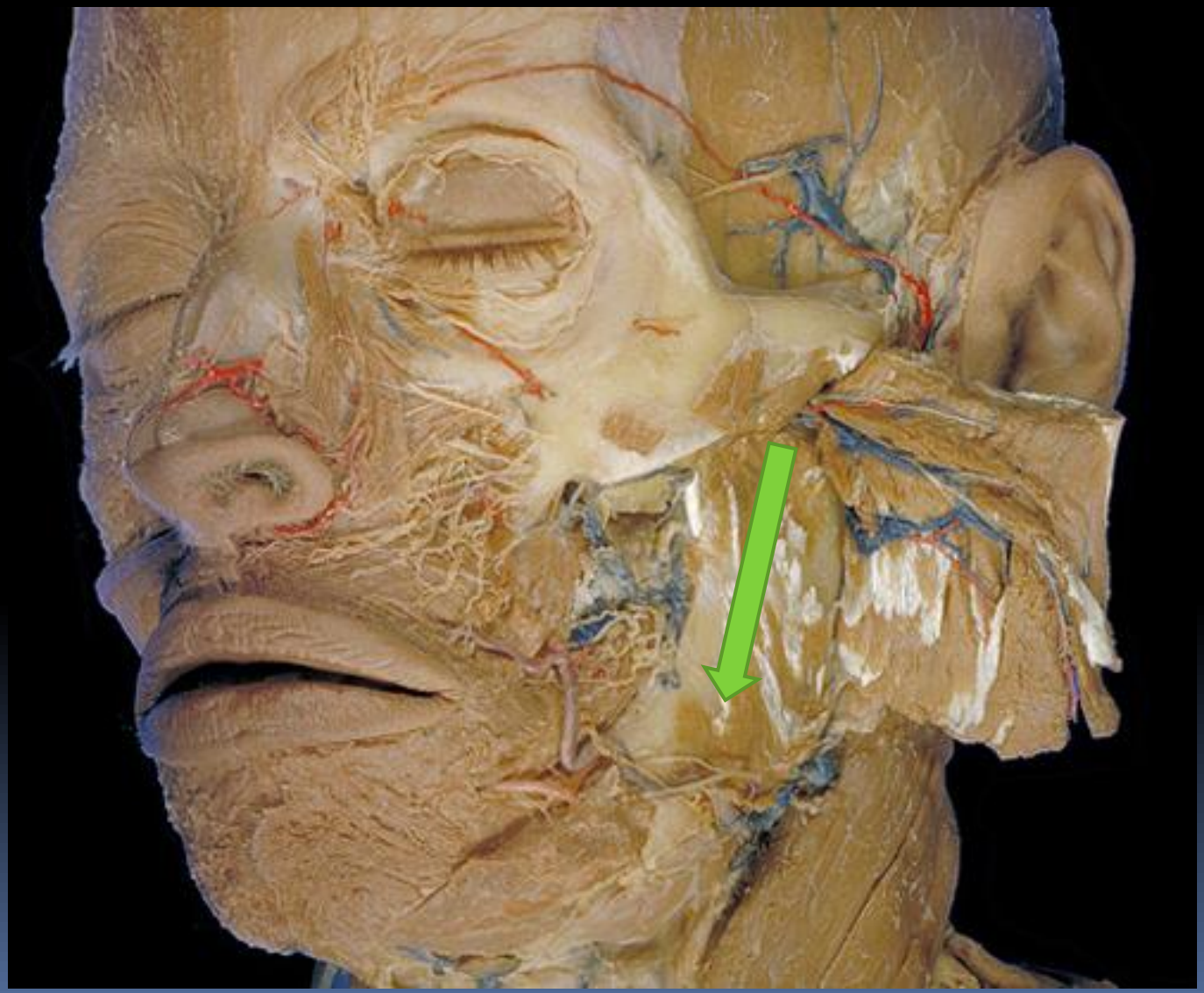
Unilateral Childhood Facial Reanimation – Exam answer

- 1 Stage reconstruction
  - Gracilis to facial vessels
  - Nerve to masseter

Childhood Facial Reanimation

- Masseteric nerve
  - Via incision taking off origin of Masseter from zygomatic arch
  - Nerve identified coursing inferiorly and anteriorly
  - Within muscle between deep and middle layers of masseter
  - Nerve stimulator assists
  - Medium caliber nerve expected

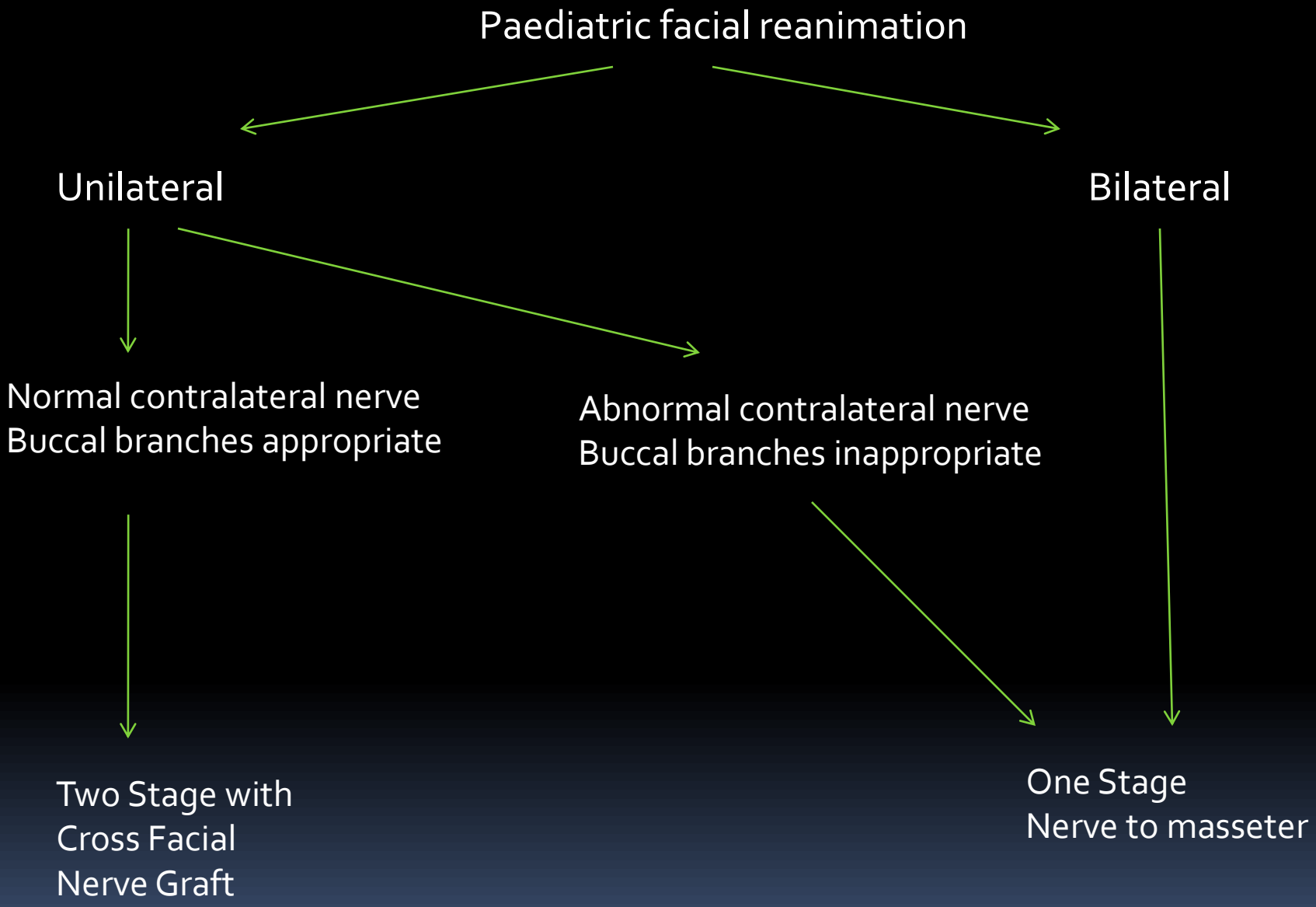
Masseteric Nerve



Masseteric Nerve

Bilateral Childhood Facial Palsy

- 1 Stage reconstruction
  - Gracilis to facial vessels
  - Nerve to masseter
  - One side at a time

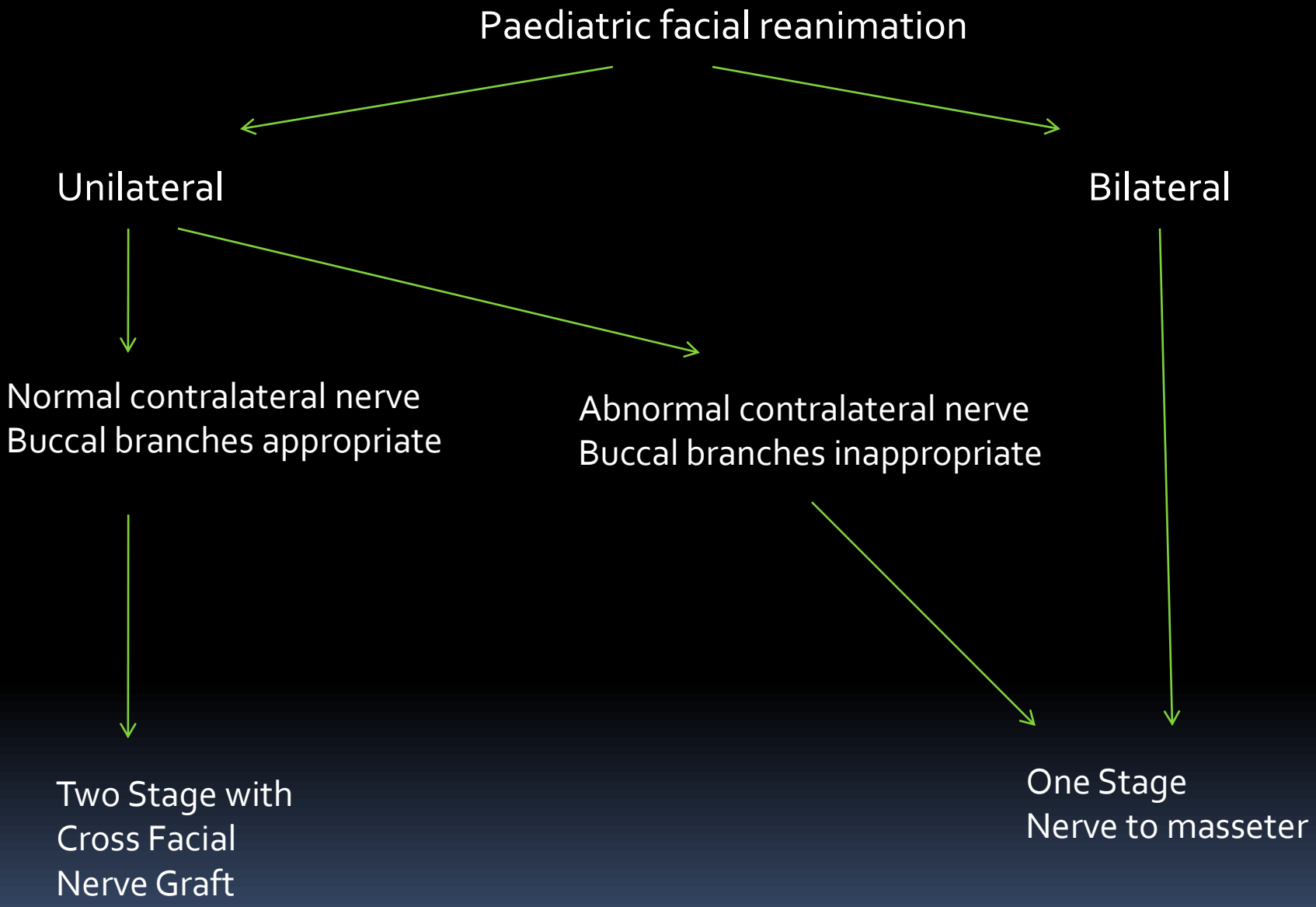

Paediatric facial reanimation
Unilateral
Bilateral
Normal contralateral nerve
Buccal branches appropriate
Abnormal contralateral nerve
Buccal branches inappropriate
Two Stage with
Cross Facial
Nerve Graft
One Stage
Nerve to masseter

Operative plan/consent

- Patient / Family counseled that if no appropriate branches contralateral nerve available
- Proceed to 1 stage masseteric nerve procedure

Exam

- Classification
- Features of Moebius syndrome
- Contrasts to adult palsy
- Recognize signs and symptoms requiring urgent/ semi urgent treatment
- Anatomy
  - Facial nerve
  - Masseteric nerve
  - Facial vessels
- Treatment algorithm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Childhood Facial Palsy

Thank you