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Facial Paralysis

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Facial Nerve...

- Anatomy
 - Origin
 - Intracranial course
 - Extracranial course
 - Branches
 - Functions



Facial Paralysis...

- Aetiology
 - Trauma
 - Neurologic
 - Infection
 - Metabolic
 - Neoplastic
 - Iatrogenic
 - Congenital / Idiopathic



Facial Paralysis...

- How do you classify?
 - House-Brackmann
 - Sydney
 - Several others



Facial Paralysis...

■ House-Brackmann Grading System

■ Grade I - Normal

Normal facial function in all areas

■ Grade II – Minimal Dysfunction

Gross

Slight weakness noticeable on close inspection

May have slight synkinesis

At rest, normal symmetry and tone

Motion

Forehead - Moderate-to-good function

Eye - Complete closure with minimal effort

Mouth - Slight asymmetry



Facial Paralysis...

■ House-Brackmann Grading System

■ Grade III – Moderate Dysfunction

Gross

Obvious but not disfiguring difference between sides
Noticeable but not severe synkinesis, contracture, or hemifacial spasm

At rest, normal symmetry and tone

Motion

Forehead - Slight-to-moderate movement

Eye - Complete closure with effort

Mouth - Slightly weak with maximum effort



Facial Paralysis...

- House-Brackmann Grading System
 - Grade IV – Moderately Severe Dysfunction

Gross

Obvious weakness and/or disfiguring asymmetry

At rest, normal symmetry and tone

Motion

Forehead - None

Eye - Incomplete closure

Mouth - Asymmetric with maximum effort



Facial Paralysis...

■ House-Brackmann Grading System

■ Grade V – Severe Dysfunction

Gross

Only barely perceptible motion

At rest, asymmetry

Motion

Forehead - None

Eye - Incomplete closure

Mouth - Slight movement

■ Grade VI – Total Paralysis

No Motion



Classification of Facial Palsy

■ Congenital

- Complete - Panfacial
- Incomplete - Buccal
Mandibular

■ Aquired

- Trauma
- Tumour
- Inflammatory
- Iatrogenic

■ Unilateral or Bilateral

■ Syndromic or Non Syndromic



Facial Paralysis...

■ Classification v. Clinical Questions

■ Transient v. Permanent

- Aetiology
- Site

■ Duration of Palsy

- ?Reinnervation



Topics...

- Functional issues
- Aesthetic Issues
- Reinnervatable facial muscles
- Nonreinnervatable facial muscles
- Age
- Unilateral / Bilateral
- Complete / Incomplete



Facial Paralysis...

- Clinical Factors – Summary
 - Corneal Exposure
 - Drooling
 - Bilabial Speech
 - Facial Asymmetry
 - Asymmetrical Smile
 - Asymmetrical Effects of Aging



Facial Paralysis...

- Clinical Factors

- Functional Issues – Sphincter Function

Facial Paralysis...

Clinical Factors

Aesthetic Issues

Brow Ptosis

Lagophthalmos

Scleral Show / Ectropion

Facial Atrophy


Facial Cant

Lack of smile

Jowling



What is a smile?



“A facial expression characterized by an upward turning of the corners of the mouth AND motivated by emotions.”-- Heritage



How does it happen?

■ Emotional

- Frontal Lobe
- Cerebral Cortex

■ Physical

- VII Nucleus
- Intracranial Nerve
- Peripheral Nerve
- Facial Musculature

True smile

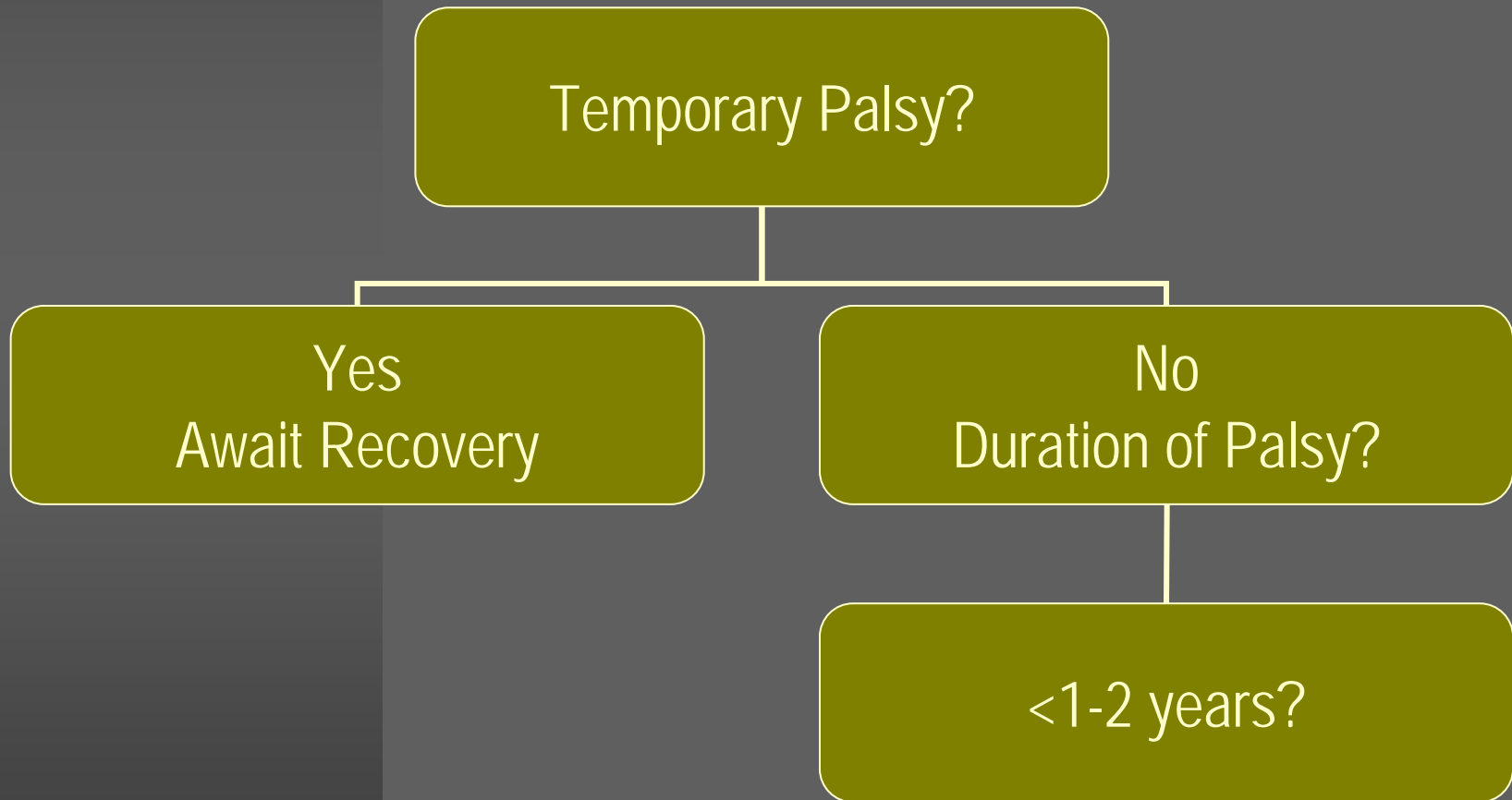
Christopher Coombs
Clinical Associate Professor



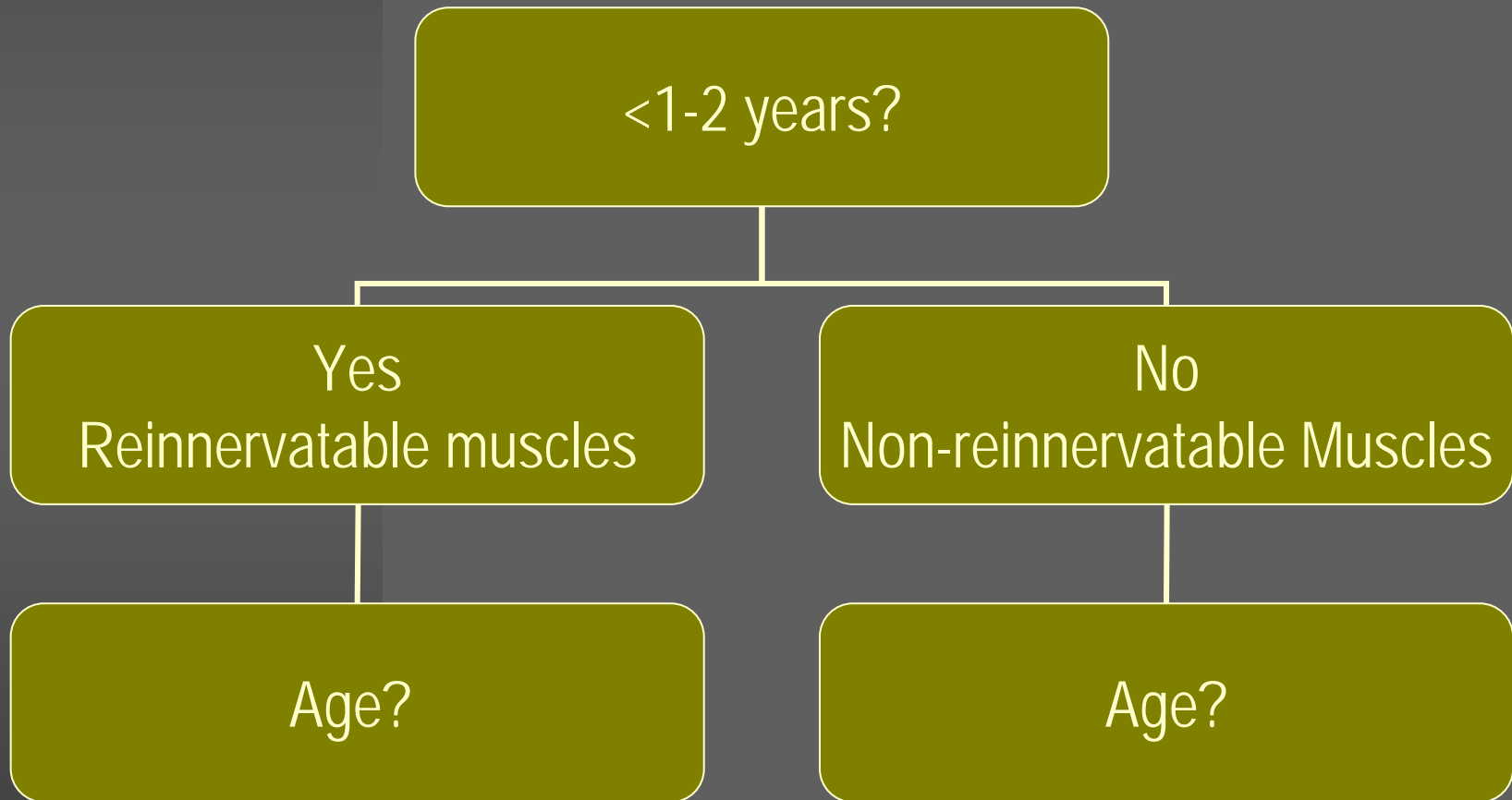
Significance of a Smile

- Psychological
- Well Being
- Self Image & Confidence
- Human Interaction

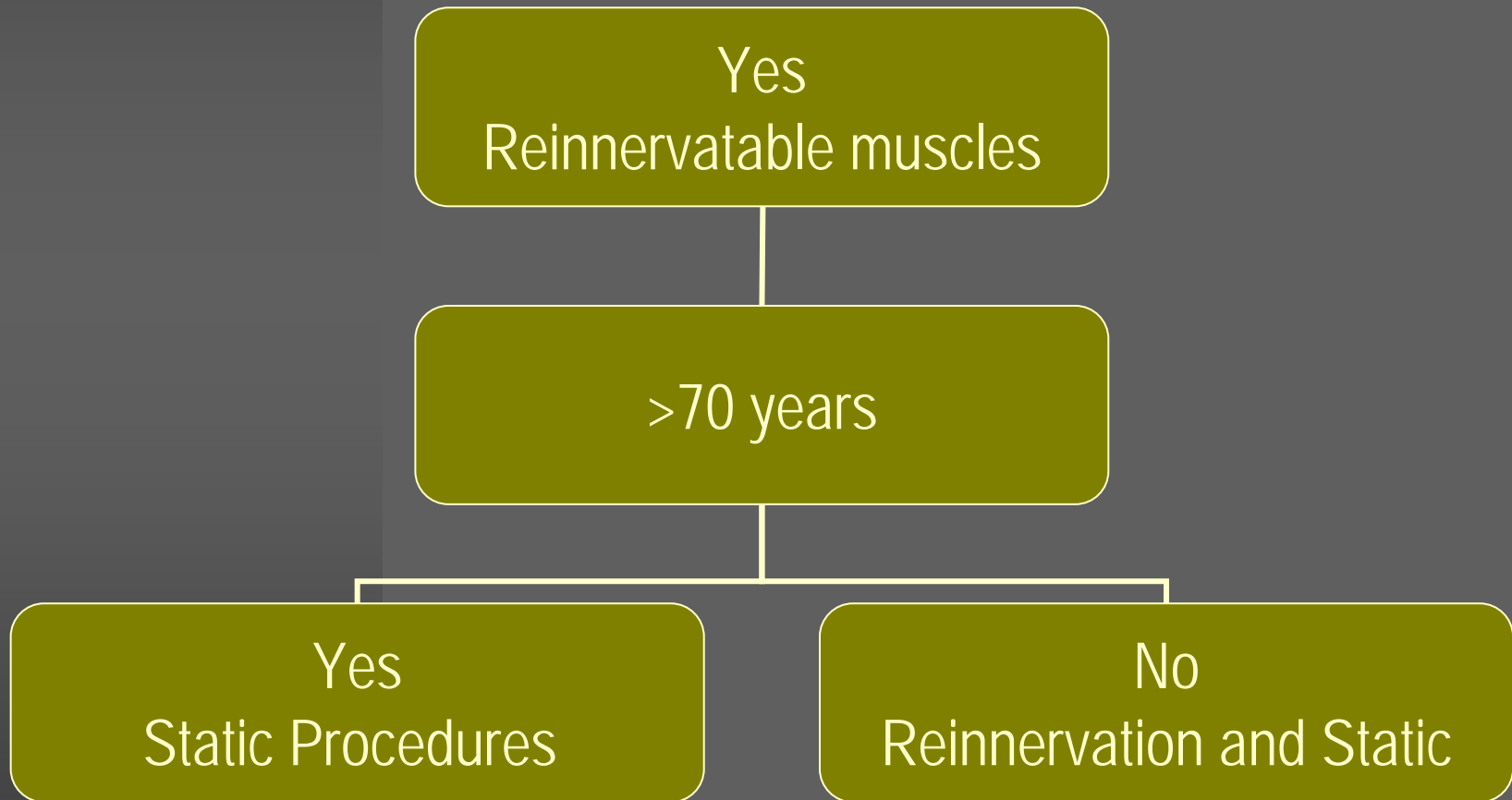
Flowchart for Reconstruction...



Flowchart for Reconstruction...



Flowchart for Reconstruction...





Reinnervation Choice of Donor...

- VII - Ipsilateral

- V - Nerve to Masseter

- XII - With Jump Graft

- XI



Contralateral VII v. Ipsilateral Nerve to Masseter...

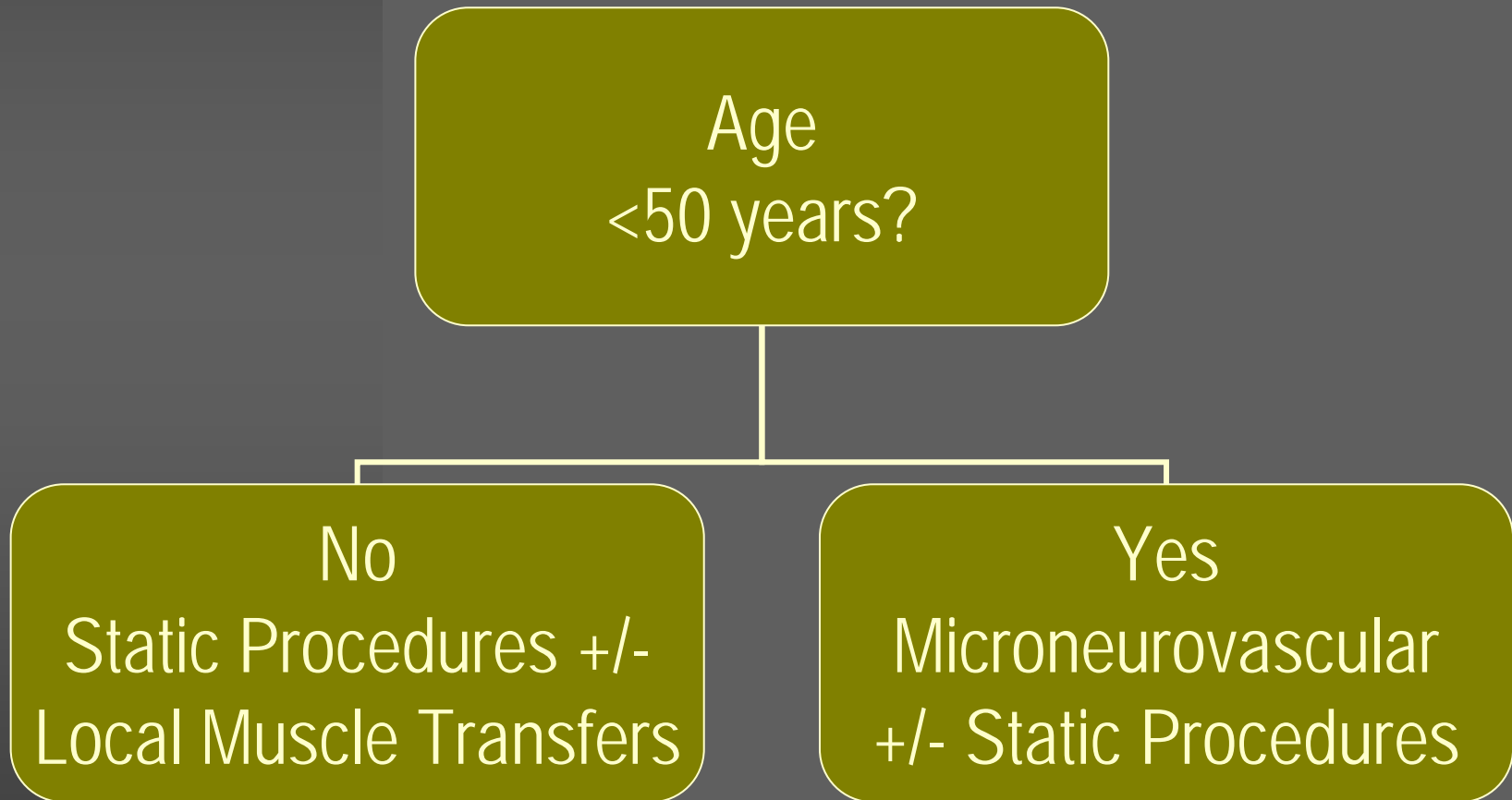
- Buccal branch – 400 – 500 axons
- Long Graft
- Significant neuronal Drop off 100 – 200 axons
- Insufficient axon for adequate reinnervation
- 100% spontaneity
- Masseter – 1500 axons approx
- No graft
- Minimal drop off
- Adequate axon for reinnervation
- 50 – 80% spontaneity



Nerve to Masseter Transfer...

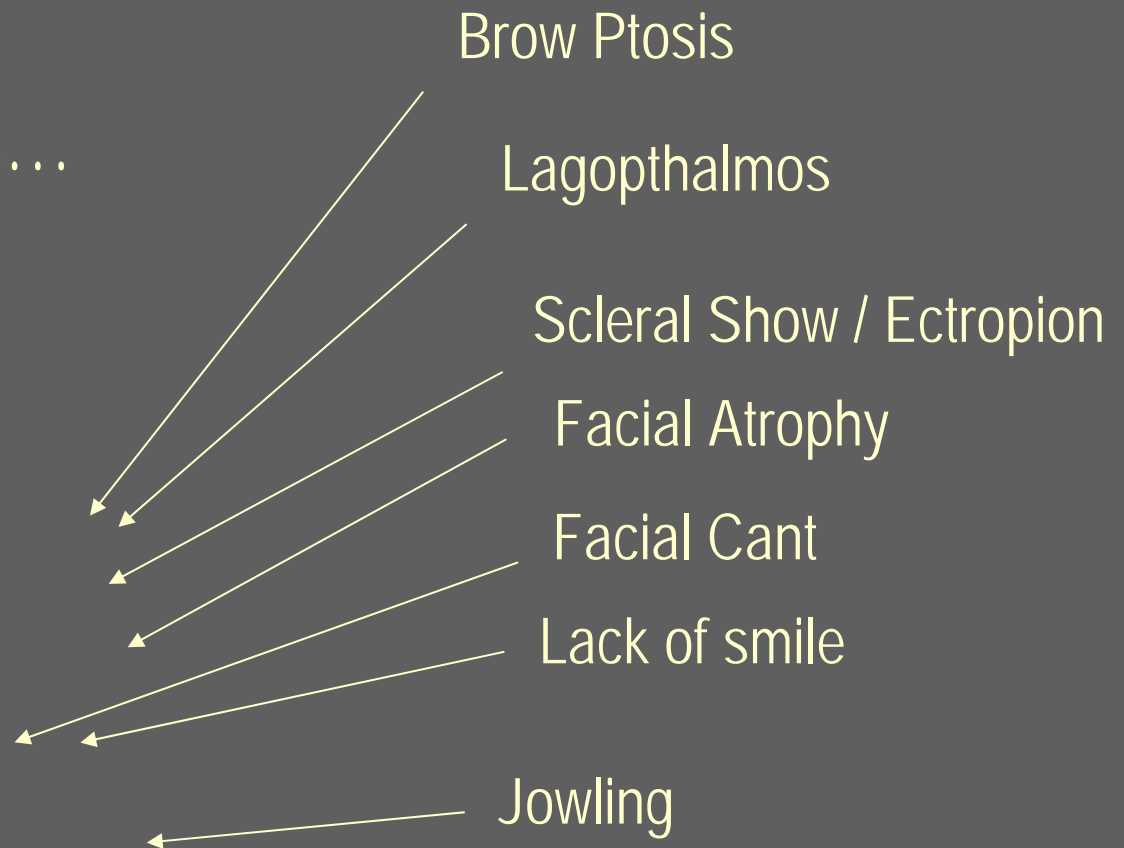
- Available
- Reliable Anatomy
- No Functional Deficit
- Spontaneity

Non Reinnervatable Muscles...



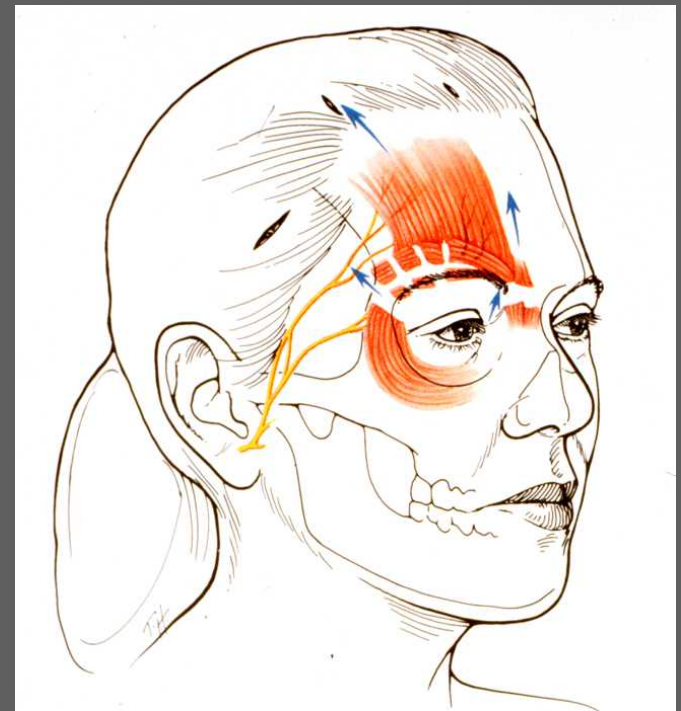
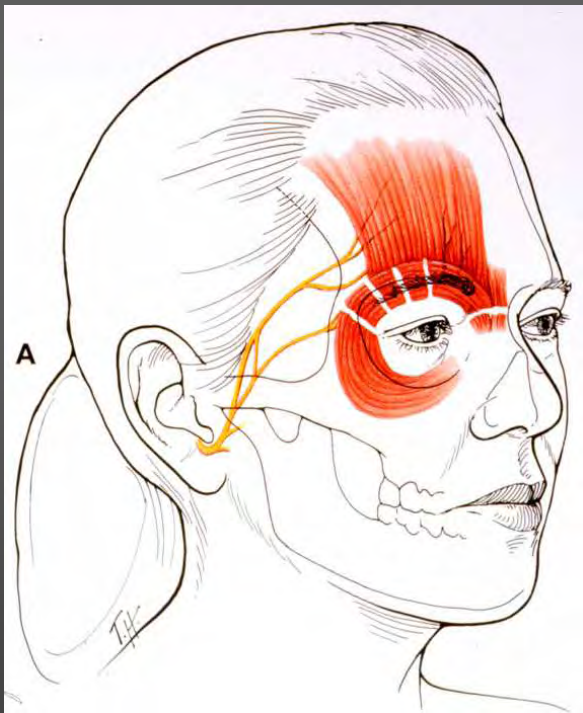
Facial Paralysis...

Reconstructive Considerations...



Brow...

■ Browlift – Open v Endoscopic



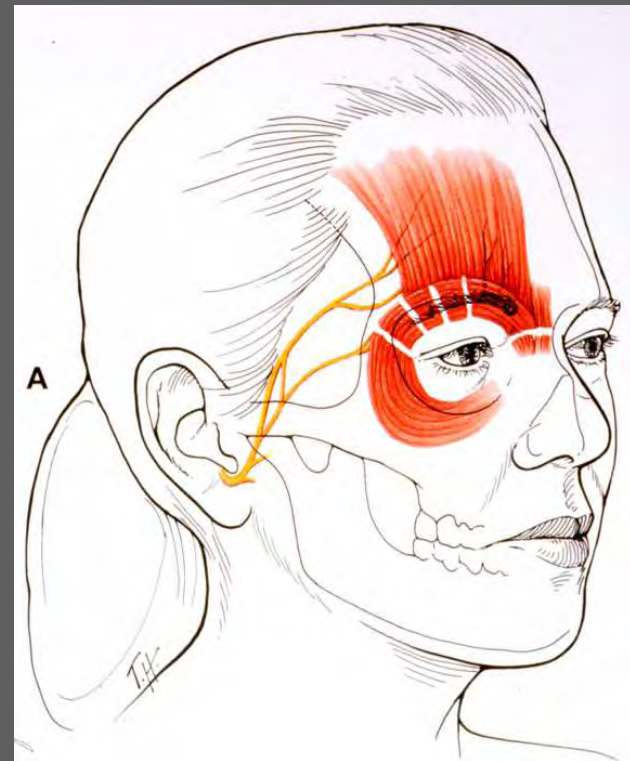


Endoscopic brow...

- Incisions
- Releases
- Myotomies
- Insert Endotine
- Elevation
- Fixation

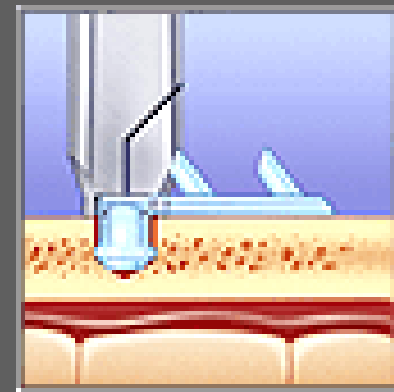
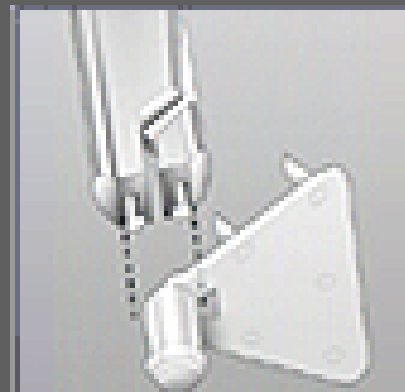
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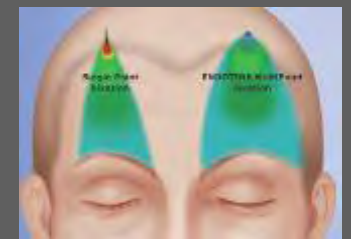
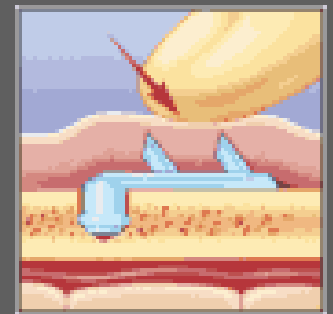
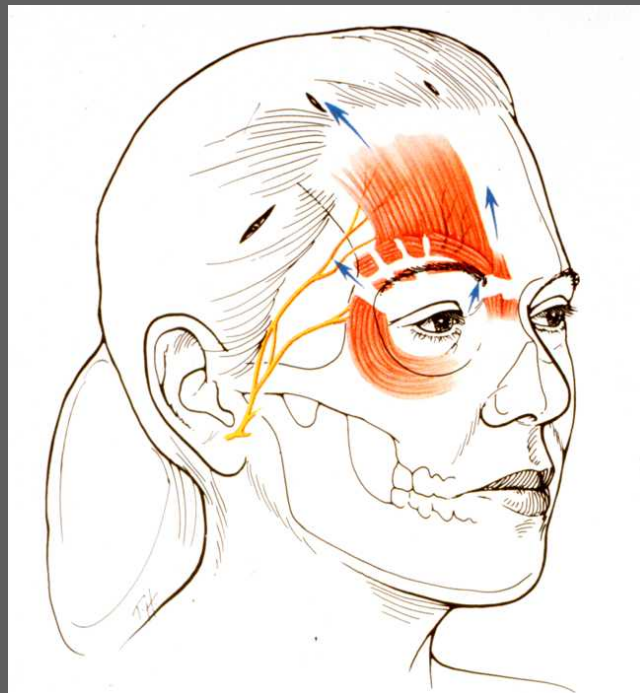
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Endoscopic brow...

- Incisions
- Releases
- Myotomies
- Insert Endotine
- Elevation
- Fixation





Corneal Protection...

■ Conservative Options

- Lubricants
- Taping
- Moisture shield

■ Operative Options

- Gold Weight
- Springs
- Tarsorrhaphy

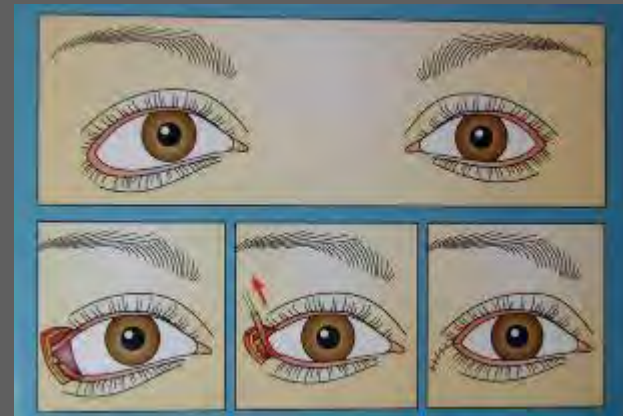


Gold weight...

- Determine by lead weight
- How Heavy?
- Heavy enough to create lid decent
- Not heavy enough to create ptosis

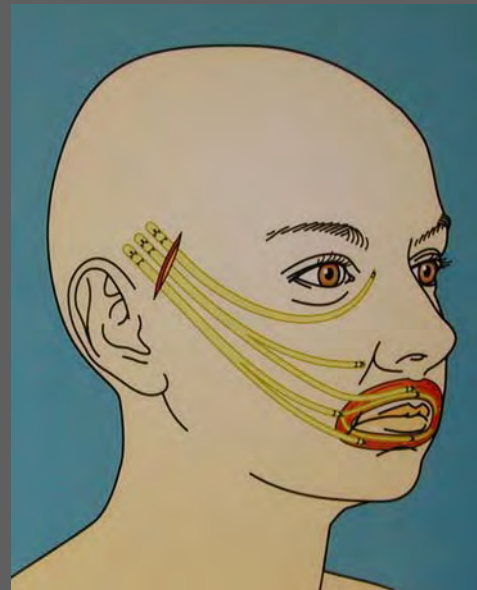
Lower Eyelid...

- Scleral Show / Ectropion
- Canthoplasty
- Sling
- Tarsorrhaphy



Fascial Slings & Meloplasty...

- Tendons – PL
Plantaris
- Facia lata
- Meloplasty – SMAS





Local Muscle Transfers...

- Brow
 - (Contralateral Frontalis)
- Eyelid closure
 - Temporalis
- Upper lip elevation
 - Masseter / Temporalis
- Lower lip depression
 - Digastric Transfer



Microvascular transfers...

- Ipsilateral N to Masseter
- One Stage
- Nerve to Masseter
- Gracilis motor unit
- 50 – 80% Spontaneous
- Older patient
- Cross Facial N Graft
- Two Stage
- X Facial Nerve Graft
- Gracilis Motor Unit
- Spontaneous Function
- Younger patient



X Facial Nerve Graft...

- Select expendable Buccal Branch
- Sural nerve graft
- Banked in Upper lip
- Wait 9 – 12/12



Nerve to Masseter...

- Intramuscular Harvest
- Coronoid Notch



Nerve to Masseter...

- Results - Nerve Biopsies 6 of each
 - Nerve to masseter
 - Av no. of axons - 1543 S.D. 292
 - Nerve to gracilis
 - Av no. of axons - 342 S.D. 158
- X facial nerve graft
 - Long Graft
 - 100 - 200 axons



Muscle options...

- Gracilis
- Pectoralis Minor
- Latissimus Dorsi



Preoperative Planning...

- Vector of new muscle
- Isolation of gracilis



Gracilis Surface Anatomy...

- Expendible
- Reliable Anatomy
- Abduct hip and extend knee to feel gracilis tendon posterior to Adductor Longus



Summary

- Objectives of facial paralysis reconstruction
 - Movement and function
 - Spontaneous expression ability
- Major improvements are possible through muscle transplantation
- Nerve preference
 - VII if available and usable
 - V as next best choice



Conclusions

- Reduce sphincter incompetence
- Achieve symmetry and balance
- Create spontaneous animation