

# Surgical Management of Synkinesis

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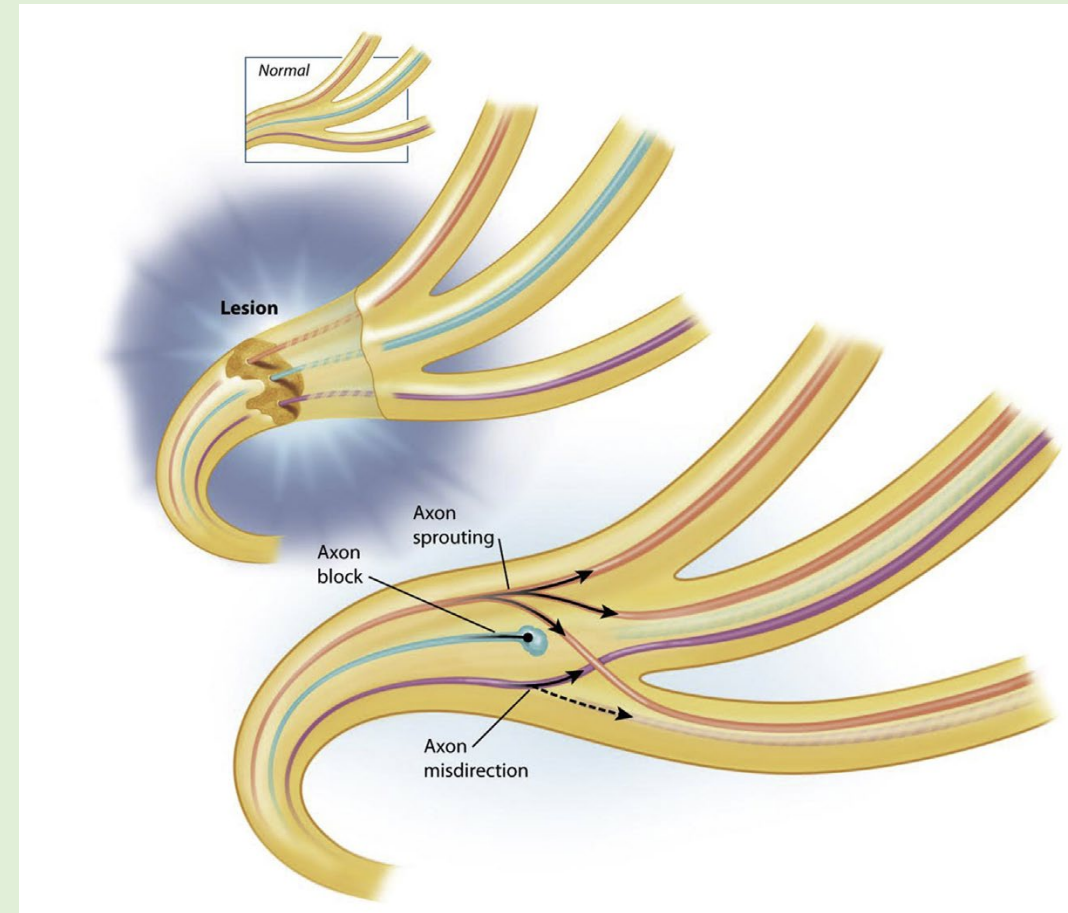
No Disclosures

But... Work from others.

New understanding in past 5 years

# Background

- Synkinesis
  - Involuntary muscle contraction that accompanies voluntary motion
  - Thought to be due to aberrant facial nerve regeneration
  - Wide spectrum of presentation
- Prominent oral-ocular or vice versa
- A feature of postparalytic facial palsy within the umbrella of postparalytic facial nerve syndrome



Azizzadeh & Frisenda 2018



Example of Oral-Ocular synkinesis

Guntinas-Lichius, O. *et al.* Pathogenesis, diagnosis and therapy of facial synkinesis: A systematic review and clinical practice recommendations by the international head and neck scientific group. *Front. Neurol.* **13**, 1019554 (2022).



## Postparalytic Facial Palsy

### Healthy Side

- Frontalis chemodeneration

### Diseased Side

- Brow ptosis correction (if depressed)
- Frontalis chemodeneration (if elevated)

**Brow**

**Periocular**

- Physical therapy (lid stretching)
- Orbicularis oculi chemodeneration
- Highly selective neurectomy

**Midface**

- Fillers to NLF
- Rhytidectomy

**Smile**

- Nerve transfer to zygomaticus
- Functional muscle transfer
- DAO chemodeneration or resection

**Lower Lip**

- DLI chemodeneration or resection

- Semi-dynamic fascia graft
- Functional muscle transfer

**Chin**

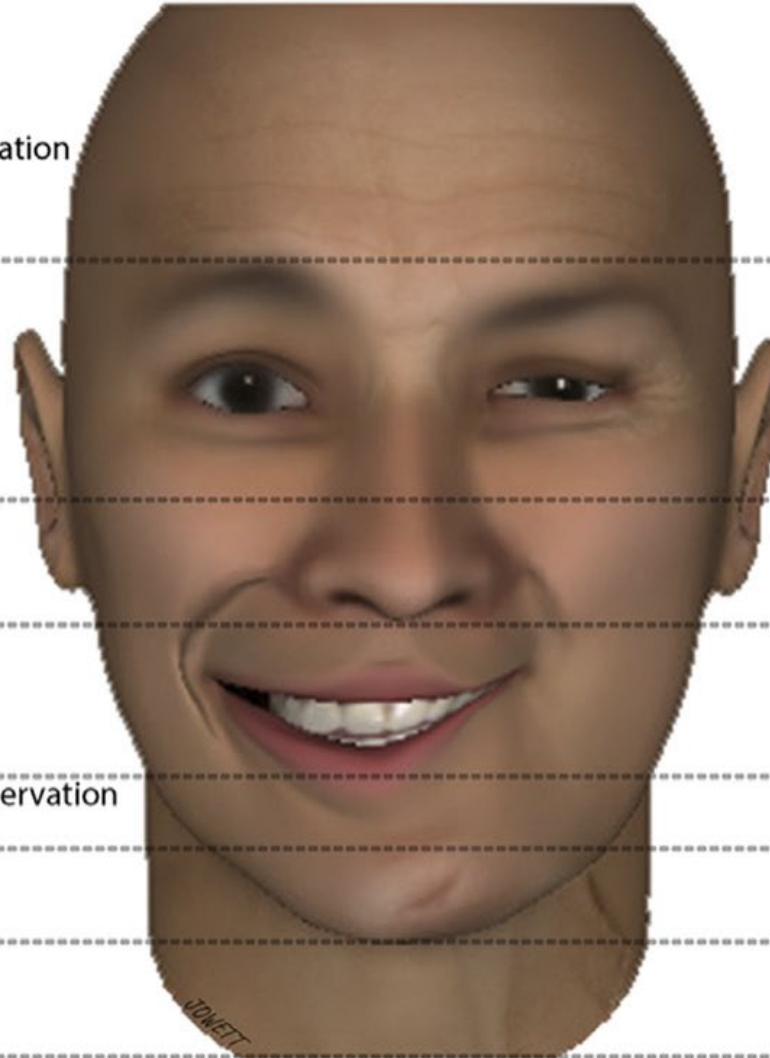
- Mentalis chemodeneration

**Neck**

- Platysma chemodeneration
- Platysmectomy

**Global**

- Physical therapy (patient education, soft tissue mobilization and relaxation, biofeedback, and neuromuscular retraining)



Jowett, N. A General Approach to Facial Palsy. *Otolaryng Clin N Am* **51**, 1019–1031 (2018).

# Incidence

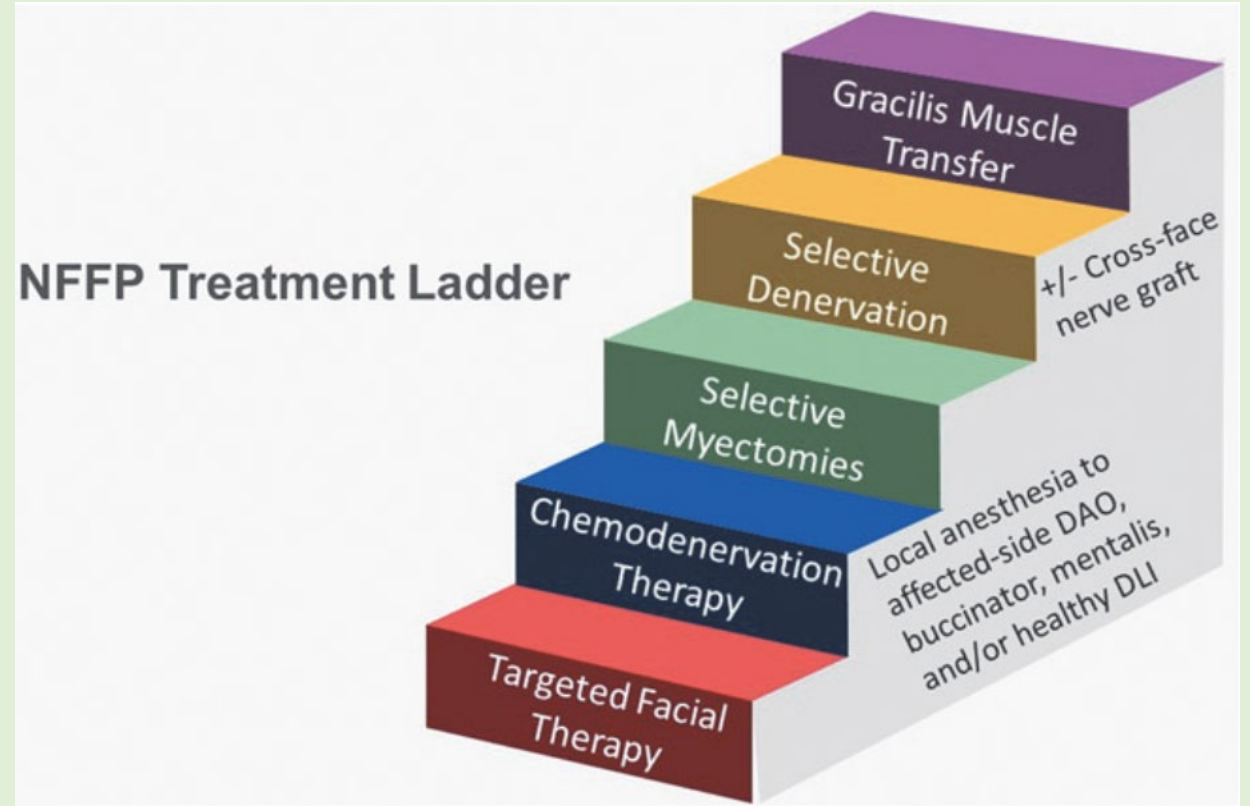
- Usually develops 3-4+ months after insult. Higher chance with higher degree of axonal injury.
- Bell's is most common cause of facial paralysis
- RCT 2016 in Scandinavia subgroup analysis found ~20% of their bells population developed synkinesis. 14% mild, ~6% were determined to be moderate to severe
  - Scores worsened on follow up between 6-12 months
- Review of 353 patients in Brazil with > 1 year paralysis found to have a rate of 55.5% with synkinesis

# Psychological Impact

- Anxiety, depression, social withdrawal
- AI trained software detected more negative emotion in facial paralysis patients with significant improvement in decreasing negative emotion and increasing positive emotion after reanimation surgery
- Perioral asymmetry, synkinesis rated to have the highest impact on quality of life
- Synkinesis – tension, fatigue, discomfort, upper lip excursion >> eye closure

# Surgical Treatment

- Myectomy
- Neurectomy
- Combination + nonsurgical

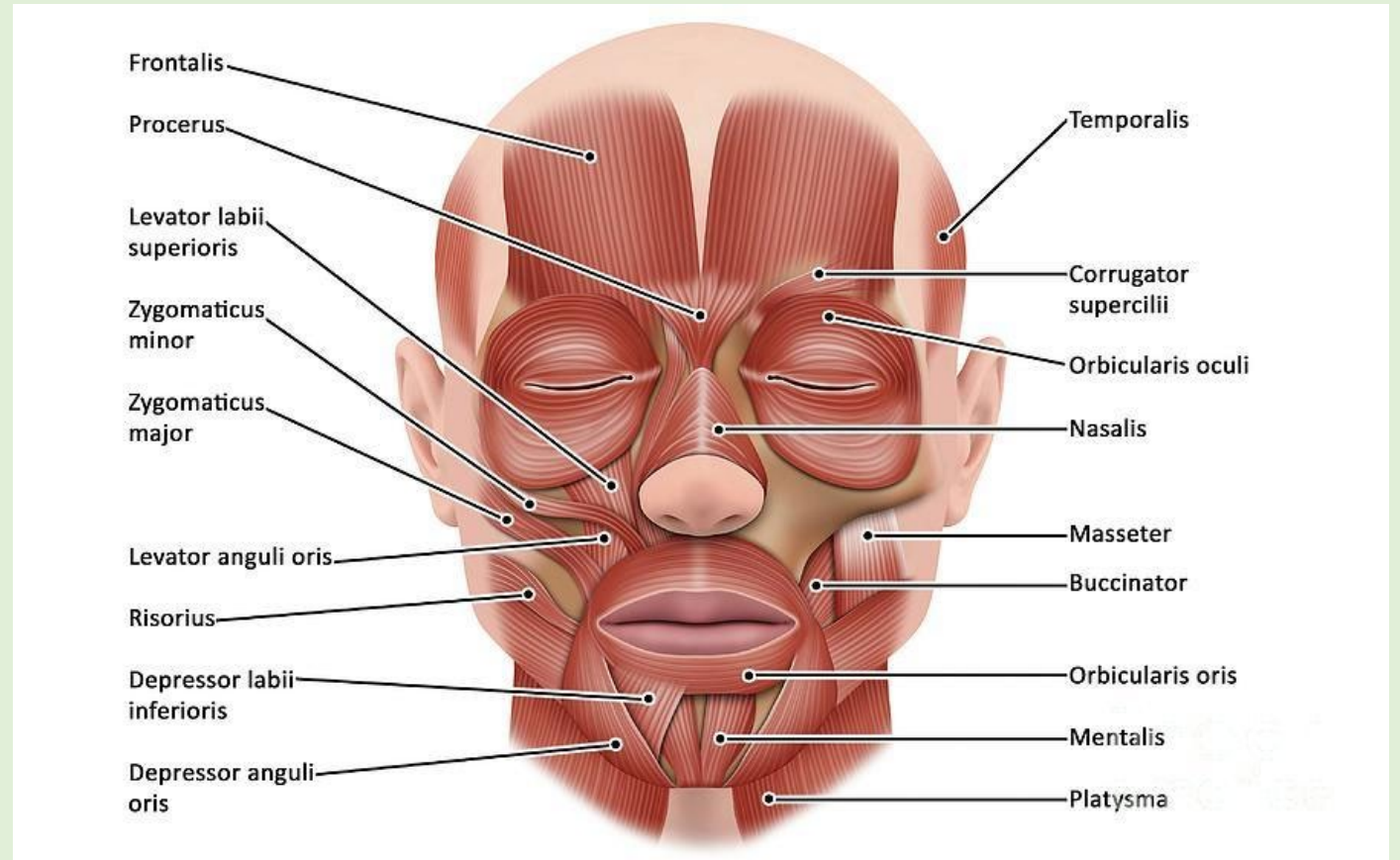


Miller, M. Q. & Hadlock, T. A. Beyond Botox: Contemporary Management of Nonflaccid Facial Palsy. *Facial Plast. Surg. Aesthetic Med.* **22**, 65–70 (2020).



# Myectomy

- Platysma, Depressor Anguli Oris (DAO), Depressor Labii Oris (DLI)
- DAO direct antagonist at modiolus for corner and lip elevation
- Lidocaine block described
- Internal and External approach

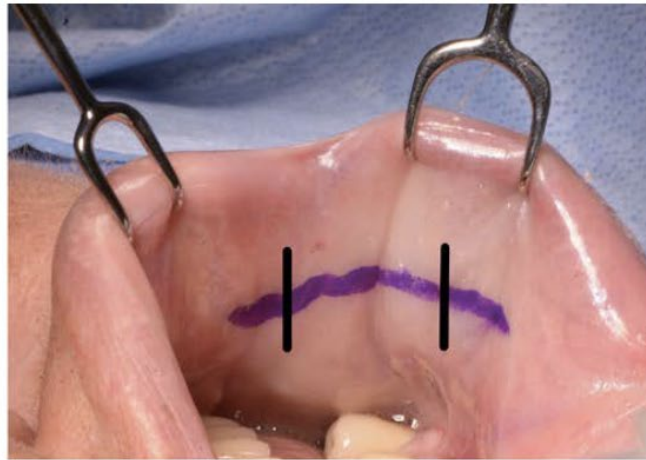


# DAO Excision

- Can Test in clinic if patients will respond with trial of local block 1% lido w 1:100,000 epi to the DAO
- Typically underestimates result



O'Rourke, S. P. & Miller, M. Q. Predicting Depressor Anguli Oris Excision Outcomes Using Local Muscle Block. *Facial Plast. Surg. Aesthetic Med.* **25**, 325–331 (2023).



Transoral approach

Described under local in clinic

Low risk

Some relapse possible



Derakhshan, A., Miller, M. Q., Malka, R., Gadkaree, S. K. & Hadlock, T. A. Releasing the Smile: Depressor Anguli Oris Excision in the Context of Managing Nonflaccid Facial Palsy. *Plast. Reconstr. Surg.* **149**, 261e–269e (2022).





**Fig. 1.** Patient with left nonflaccid facial palsy before (*left*) and after (*right*) left depressor anguli oris muscle excision.

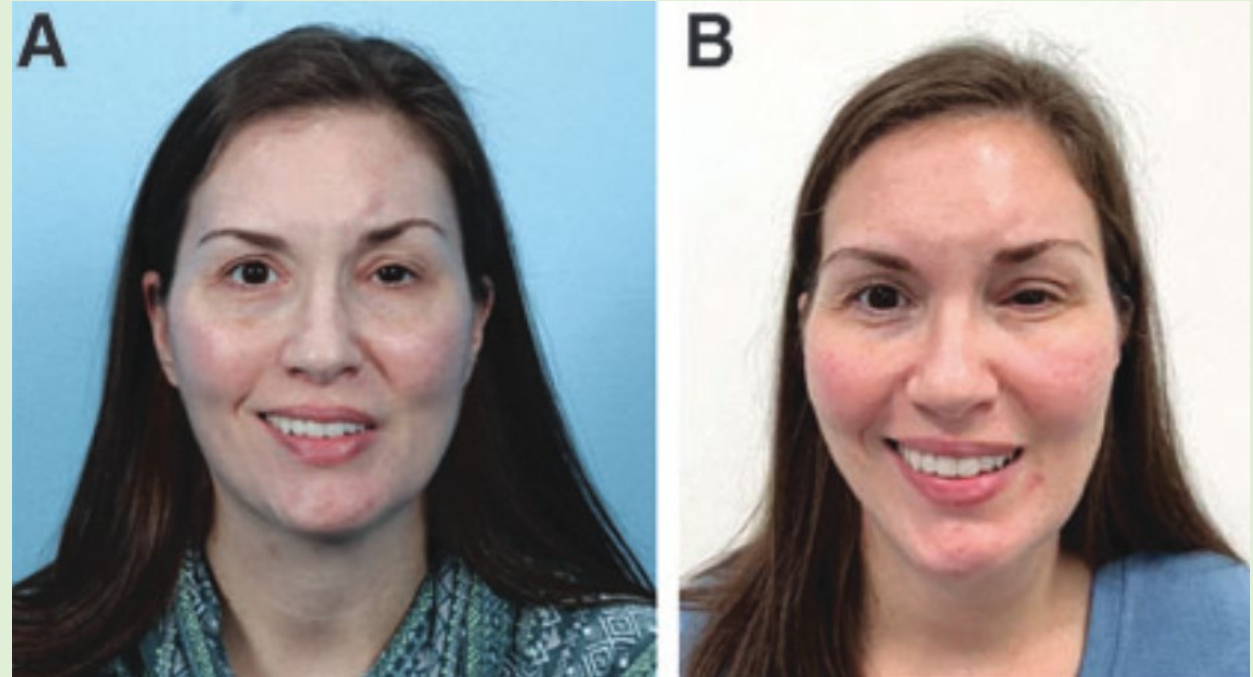
Derakhshan, A., Miller, M. et al.



**Fig. 2.** Patient with right nonflaccid facial palsy before (*left*) and after (*right*) right depressor anguli oris resection.

# Transcutaneous Approach

- Described via 3mm punch biopsy at site of DAO 1cm lateral and inferior to the oral commissure
- Will directly run into the DAO fibers so no need to go around buccinator

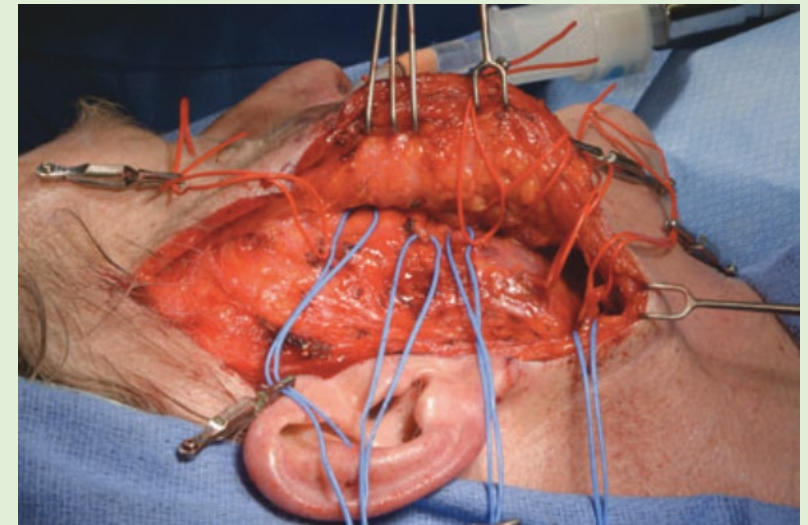
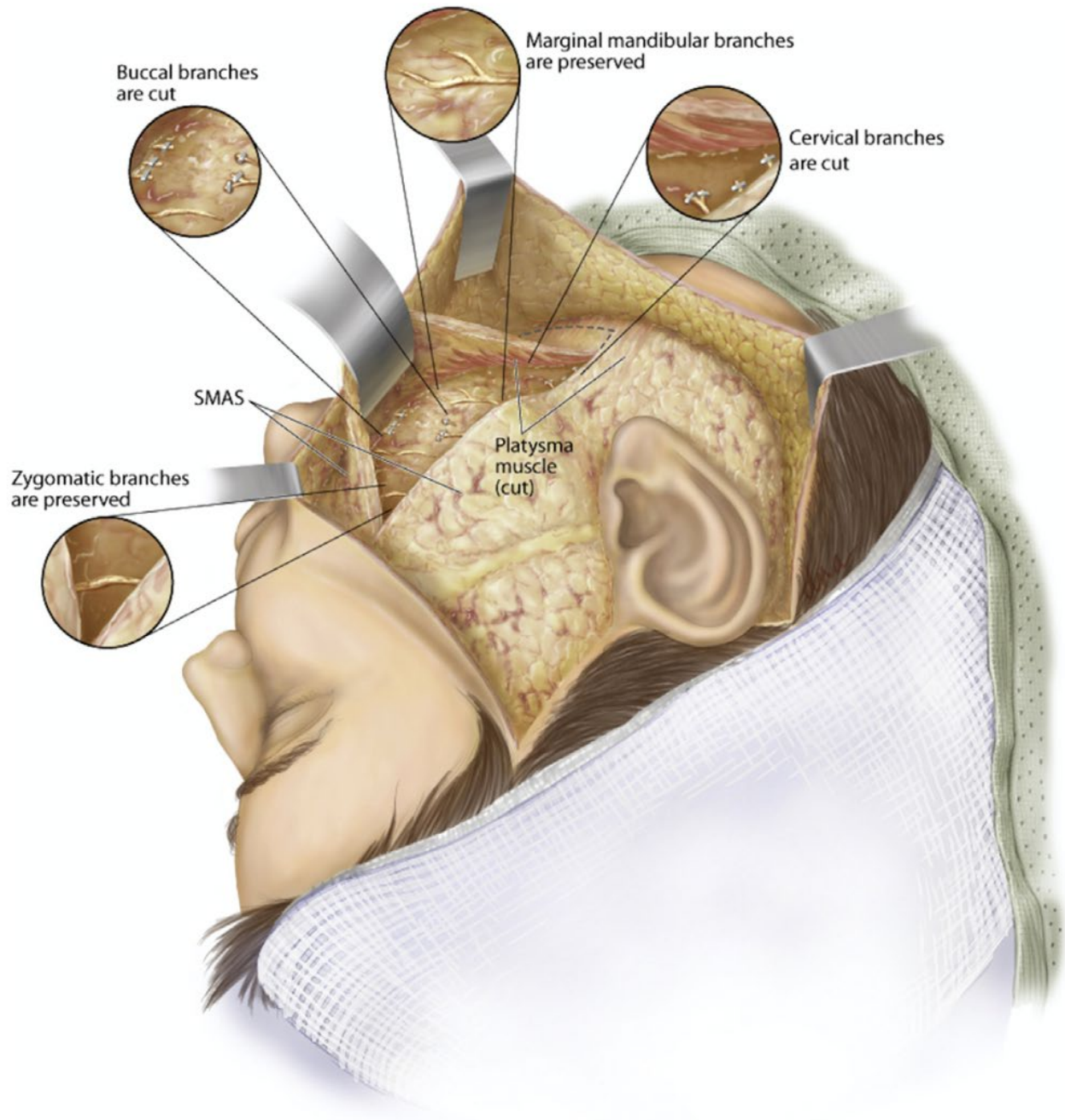


Dey, J. K. & Boahene, K. D. O. Minimal Access Percutaneous Depressor Anguli Oris Myectomy and Terminal Neurolysis for Facial Paralysis Patients with Aberrant Reinnervation Syndrome. *Facial Plast. Surg. Aesthetic Med.* **25**, 365–366 (2023).



# Modified Selective Neurectomy

- Described by Azizzadeh and Frisenda in 2018
- Indications: Stable synkinesis, intact zygomatic muscles, intact distal nerve branches
- Goal is to improve oral synkinesis
  - **Preservation** nerve controlling DLI, pure orbicularis closing, lip elevating movement
  - **Severing** of lateral and inferior movement on the commissure and platysmal tightening

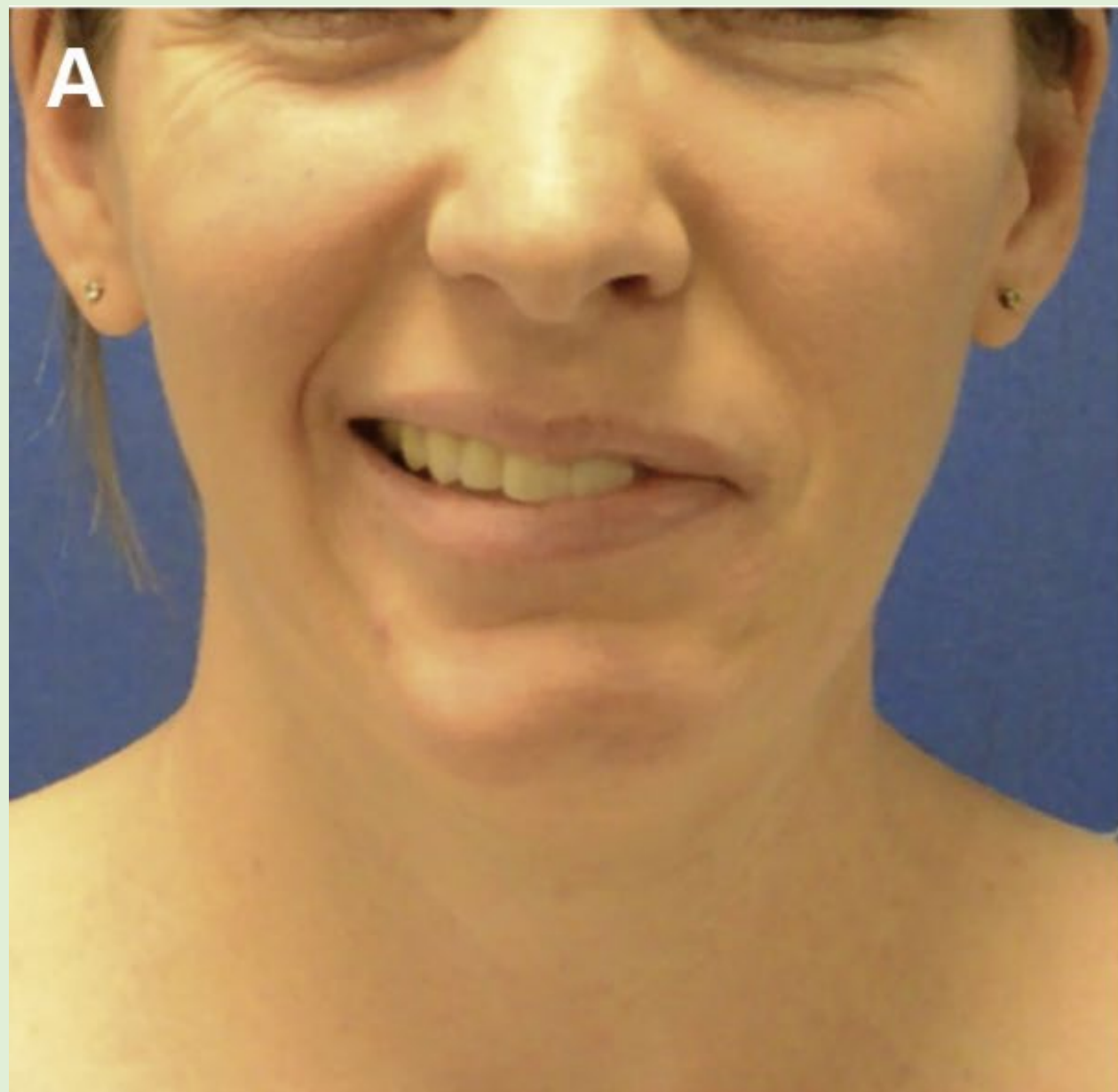


6.7?









# Not without risk

- Azizzedah
  - 11% temporary oral incompetence (7days – 8 months)
  - 98% satisfaction at last post operative visit
- Miller, Hadlock
  - Up to 41% temporary worsening drooling immediately post op
  - Worse in people who had a higher nerve sacrifice to preservation ratio
  - 21% with temporary new/exacerbated oral incompetence
  - Rates decreased with decreasing excision:preservation



# Recent reviews and meta-analysis

- MSN can improve PROM data FaCE and SAQ >1 year
- Improvements in oral function, social function, facial movements and facial comfort
- Potential decrease in lacrimal control, no difference in eye comfort
- Decrease in post operative botox requirements and previously refractory botox patients reported control with post op botox

Thank you!

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