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Botulinum toxin injection in the crico-pharyngeus muscle For dysphagia treatment

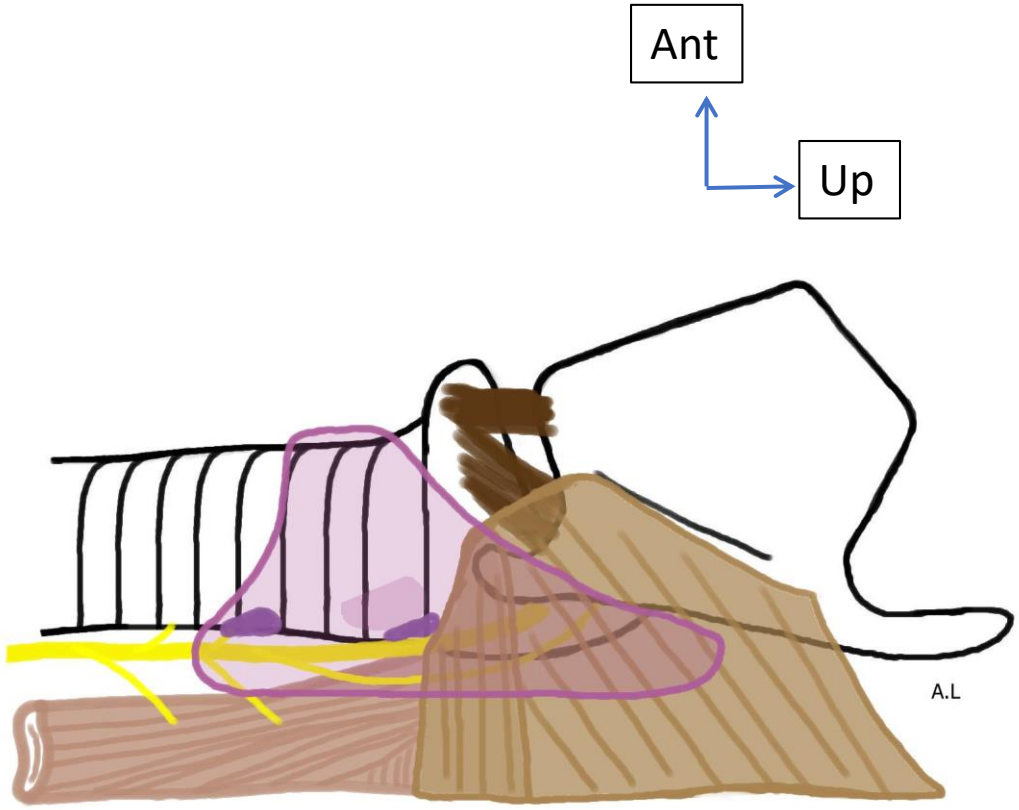
Aude Lagier

Oto-rhino-laryngology department

CHU of Liège, Belgium

Anatomy of the crico-pharyngeus

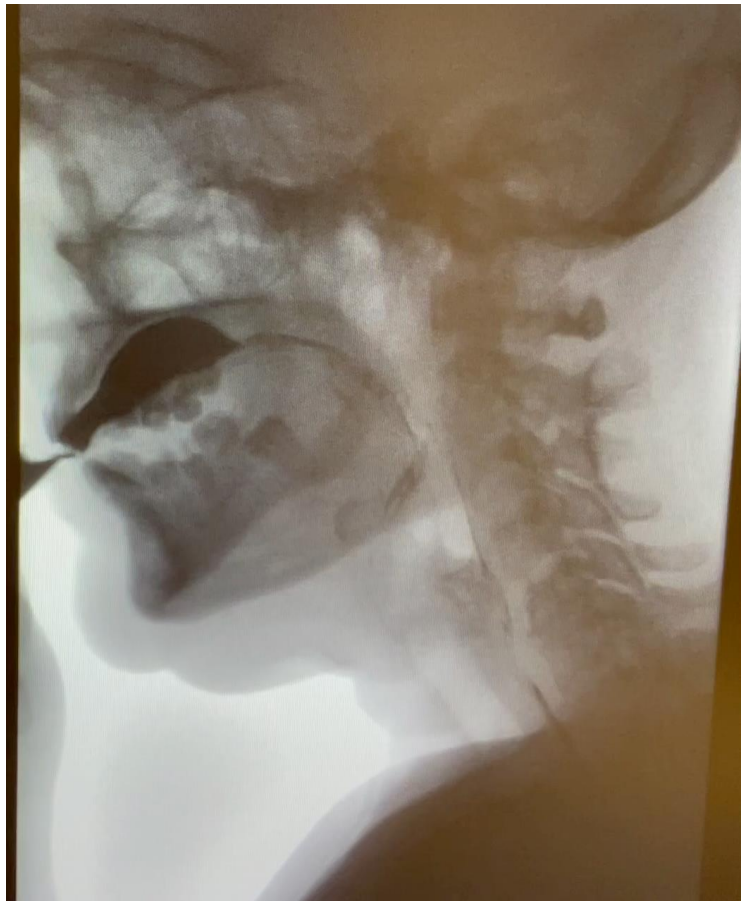
- Thin muscle
  - 2,7-2,8 mm width
- Neuro-muscular endplates:
  - Scattered pattern
- Innervation originating from:
  - Extralaryngeal branch of RLN
    - Lateral and inf.part (33%)
  - Pharyngeal plexus
    - Postero-medial part (83%)
    - And posterolateral part (83%)
  - Injection in the postero-lateral part of the muscle seems the more suitable.



Kim BH, Kim DH, Lee JH, Lee HJ, Kim HJ. Evaluating intramuscular neural distribution in the cricopharyngeus muscle for injecting botulinum toxin. Auris nasus Larynx. 2023. 50: 87-93.

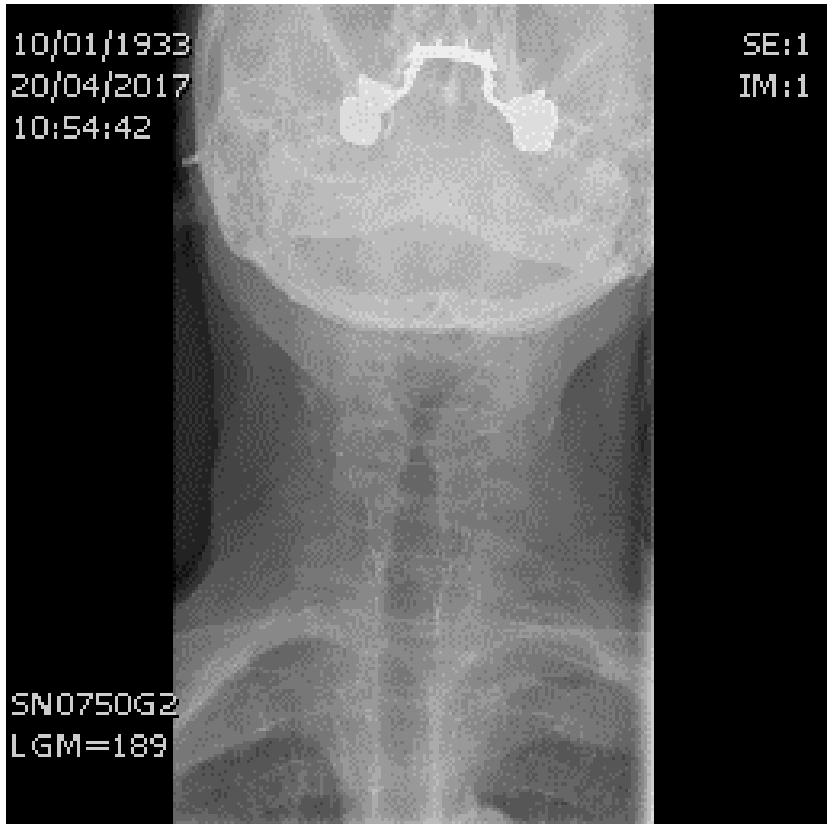
Crico-pharyngeus muscle and dysphagia

- Main (upper) part of the UES
  - High pressure area at the upper extremity of the oesophagus/junction pharynx-oesophagus
  - UES pressure= myogenic activity + tissue passive elasticity
  - Active relaxation during swallowing

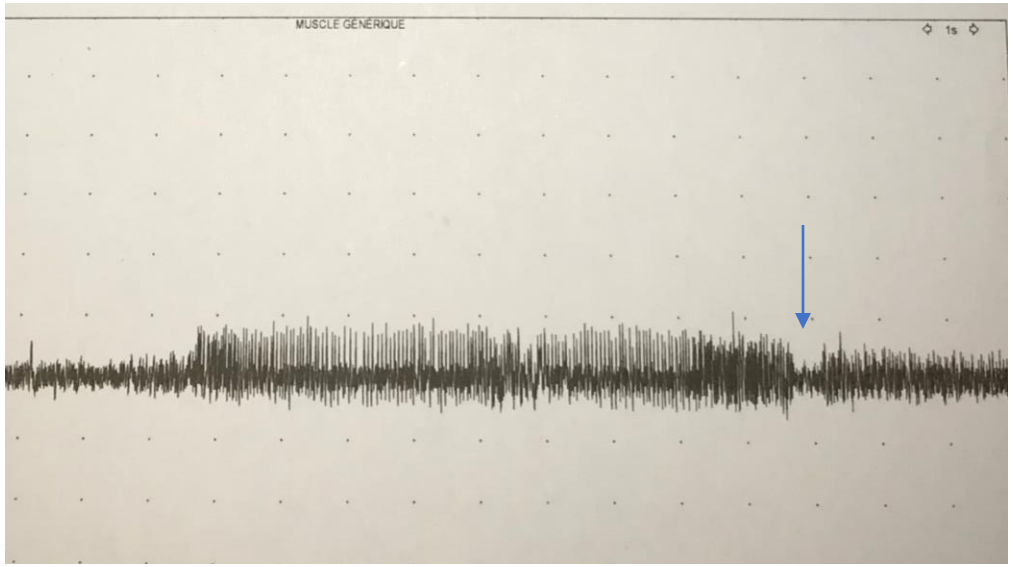


Crico-pharyngeus muscle and dysphagia

- Opens at the end of the pharyngeal phase
  - Balance between pharyngeal propulsion and UES opening
  - Protection of the airway against reflux
  - Prevents the entry of air in the oesophagus
- Interpretation
  - Sometimes not so easy



Botulinum toxin in UES: techniques



- Doses:
  - Extremely variable among the literature
  - 15-100 U Eq.Botox

- Percutaneous
  - Most often on the left side
  - Anterolateral wall of UES
  - Depending of the lenght of the UES narrowing, several injection may be considered
  - Guiding: CT< endoscope<US +/- catheter balloon< EMG

Botulinum toxin in UES: techniques

- Endoscopically guided
  - Under GA and rigid oesophagoscope
  - Under LA and flexible endoscope

Efficacy of botulinum toxine

- Target: circular muscle layers of the UES
- Local spread/diffusion/migration of the toxin
  - Depends on the toxin (dysport trend to >botox)
  - Depends on the concentration and the injected volume

- Results:
  - Improvement of UES opening in 100%
  - Improvement of hypopharyngeal residues and inhalation: >50%-90%
  - Improvement in dietary status:>50%
  - Improvement in Dysphagia outcome severity score >50%

- Can be repeated if insufficient effect

Side effects and complications

- Due to unfavorable diffusion
  - To the pharynx ->increase in dysphagi
  - To the PCA
    - On 1 side
    - On 2 sides ->dyspnea
- Contra-indication for all the CP procedures
  - Massive reflux

Botulinum toxine in UES vs other techniques

- Botulinum toxin:
  - Efficacy: 43-100%
  - Complications: 0-25%
- Crico-pharyngeal myotomy
  - Allows biopsies
  - External
    - GA
    - Complication: RLN injury, fistulization of the pharynx or oesophagus
  - Endoscopic
    - Complication: Inadvertant entry into the neck with mediastinitis
  - Efficacy: 25-100%
  - Complications:0-39%
- Dilatation
  - Balloon or Savary dilator
  - Several protocols under GA or LA, variable number of repetitions
  - Efficacy: 58-100%
  - Complications: 0-20%

Conclusion

- Effective treatment
  - The main question is the role of the UES in the dysphagia
- Low rate of complications
  - But need to very accurate localization
  - Whatever the guidance technique
- Very minimal invasive
  - GA ->LA
  - Repetition possible
- Alternative or in addition to balloon dilatation?
- Test of myotomy effectiveness?

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