Branchial Cleft and Pouch Anomalies

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Emberyological Basis
Types of Anomalies

- Sinus
  - External
  - Internal
- Fistula
- Cyst

Branchial cleft and pouches anomalies

Incidence

- 2nd cleft&pouch 95%
- 1st 5%
- 3rd and 4th rarely reported
**First Branchial Cleft Anomalies**

- The first branchial cleft is the only cleft that does not become obliterated by the 8th week.
- First cleft anomalies are a result of incomplete closure of the cleft.

**Classification**

- Arnot, 1971
- Work, 1972
- Olsen et al, 1980
First Branchial Cleft Anomalies

Site

- Preauricular and cervical region above hyoid bone
- The incidence of malformation is higher at the top of the triangle (Trigalia et al., 1998)

• Otological Manifestations
• Parotid Manifestations
• Neck Manifestations

Pochet’s triangle

First Branchial Cleft Anomalies

Presentation

- Cyst
- Sinus
- Fistula

Infection
Prior Surgery
First Branchial Cleft Anomalies

Presentation
First Branchial Cleft Anomalies

Presentation
First Branchial Cleft Anomalies

Presentation

Branchio-Oto-renal syndrome
Autosomal dominant
Renal, 1st and 2nd arches
• Hearing impairment 73%
• Preauricular pits 70%
• Renal abnormalities 67%
• Branchial cleft cyst or sinus 60%
The relationship of the branchial anomaly to the facial nerve is variable

- The fate of branchial apparatus is complete by 6 or 7 week
- Parotid gland appear at 6th week
- Facial nerve and muscles migrate upward between 6-8 week

**First Branchial Cleft Anomalies**

**Facial Nerve**

- In the Majority of cases, The anomaly is lateral to the nerve
- Miller et al, 1984; Sinuses lateral to the facial nerve
  - Fistulae medial to facial nerve
- Solares etal, 2003;
  - Complete fisulae are usually deep to the facial nerve
First Branchial Cleft Anomalies

Facial Nerve
First Branchial Cleft Anomalies

Facial Nerve

Cyst
First Branchial Cleft Anomalies

Facial Nerve
The facial nerve is vulnerable to injury:
- Variable relation of the facial nerve
- Prior surgeries
- Prior infection
- 15-30% Facial nerve insult
First Branchial Cleft Anomalies

Ext. opening: Ant. Border of sternomastoid muscle in the mid or lower neck.

Second Branchial Cleft Anomalies
Second Branchial Cleft Anomalies

- Course: Deep to the platysma, along the carotid sheath, then between 2 carotids, superficial to nerve XII, IX deep to stylohyoid ligament and post. Belly of the digastric muscle
- Internal opening: Anterior aspect of the upper half of the post. pillar of the tonsil

Sinus or Fistula

How

Why
Second Branchial Cleft Anomalies

False negative
- Not canalized along the whole length
- Obstructed by infection
Second Branchial Cleft Anomalies

How?

- Clinical examination
- Sinogram
- Intraoperative MB injection
- Intraoperative tract searching
Why?

- For complete excision
- To prevent recurrence

Second Branchial Cleft Anomalies

Pull Through Branchial Fistulectomy

Prof. M. Talaat
Second Branchial Cleft Anomalies

Pull Through Branchial Fistulectomy
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Pull Through Branchial Fistulectomy

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Second Branchial Cleft Anomalies

Cyst
Second Branchial Cleft Anomalies

Cyst
Second Branchial Cleft Anomalies

Cyst
Second Branchial Cleft Anomalies

Cyst
Second Branchial Cleft Anomalies

Infected Cyst
Second Branchial Cleft Anomalies

Infected Cyst

Second Branchial Cleft Anomalies

Infected Cyst
3rd and 4th Branchial Cleft Anomalies

- Rarely reported
- Failure of the pouches to obliterate
- 3rd: Inferior parathyroid, Thymus
- 4th: Superior Parathyroid, PFC
- Pharyngobranchial duct

Presentation

- Cyst in close relation to the thyroid gland
- Sinus tract; pyriform sinus
- External opening
3rd and 4th Branchial Cleft Anomalies

Presentation

- Cyst in close relation to the thyroid gland
- Sinus tract; pyriform sinus
- External opening

![Image of a medical scan showing a cyst related to the thyroid gland and a pyriform sinus.]

3rd and 4th Branchial Cleft Anomalies

Presentation

- Cyst in close relation to the thyroid gland
- Sinus tract; pyriform sinus
- External opening

![Image of a medical scan showing a cyst related to the thyroid gland and a pyriform sinus.]

3rd and 4th Branchial Cleft Anomalies

Presentation

- Cyst in close relation to the thyroid gland
- Sinus tract; pyriform sinus
- External opening

![Image of a cyst in close relation to the thyroid gland]

![CT scan showing 3rd and 4th branchial cleft anomalies]
3rd and 4th Branchial Cleft Anomalies

Presentation

- Cyst in close relation to the thyroid gland
- Sinus tract; pyriform sinus
- External opening
3rd and 4th Branchial Cleft Anomalies

Presentation

- Cyst in close relation to the thyroid gland
- Sinus tract; pyriform sinus
- External opening
Midline Cervical Cleft

• It is not a "true" cleft, as it does not involve a gap between adjacent skin flaps and only extends partially through the skin layers.

• The cleft is often weeping at birth, then toughens and dries, healing with a scar.

• A subcutaneous fibrous cord that originates from the deep layer of the skin tag and ends in the subcutaneous tissue of the chin.
Conclusion

- Branchial arch anomalies should be bared in mind in all cysts or sinuses located from the root of the helix to the clavicle
- Other congenital anomalies Should be excluded
- Complete fistula has to be diagnosed
- Pull through branchial fistulectomy for complete fistula of the 2\textsuperscript{nd} arch
- 1\textsuperscript{st} branchial arch anomalies should be excised with wide approach with care of the facial nerve

Thank You