Pneumomediastinum following a dental procedure

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Case report

- A 3-year old girl with no previous serious known diseases
- Swelling of the face and neck during a prolonged dental procedure under general anesthesia
Case report

In the ICU:
- Subcutaneous emphysema at the level of the head, neck and thorax
- Afebrile
- Normal blood analysis
- Normal pulmonary auscultation finding, heart rate 140/min, blood pressure 100/60 mmHg
- 100% oxygen saturation with oxygen mask
Case report – imaging findings
Case report – imaging findings

Did we really need it?
Case report – imaging findings
Case report – imaging findings
Our diagnosis

- Bronchoscopy found no pathology, neither did the oesophagoscopy
- After oxygen therapy and antibiotic prophylaxis the patient was discharged from the hospital
Our diagnosis

Spontaneous pneumomediastinum, pneumoperitoneum and retropneumoperitoneum induced by a dental procedure
**Discussion**

- For the first time described in the early 20th century by Turnbull
  

- Subcutaneous emphysema, after tooth extraction and a Valsalva maneuver

- Since the 1960s high-end air-speed drills are used in dentistry
  

- Most of them nowadays have air and water coolers
Discussion – potential spaces

Direct communication of the base of the 1st, 2nd and 3rd molar roots with the sublingual and submandibular spaces

www.exodontia.info/LudwigsAngina.html
The submandibular space communicates with the retropharyngeal space and the latter is continuous with the mediastinum.

Frias Vilaça et al; Insights into Imaging. 2013;4:759
Communication of the mediastinum and retroperitoneum at the level of the foramina of Morgagni (sternocostal triangles) and the oesophageal and aortic hiatus

Frias Vilaça et al; Insights into Imaging. 2013;4:759
Diagnosis

- Clinical examination: dyspnea, chest pain, edema, crepitus sound, erythema, odynophagia, Hamman’s sign
- Patient’s history
- Blood test may be normal

- Chest X-rays (PA/AP/laterography) and/or CT to confirm the diagnosis
Management

- Early recognition is important
- Usually a self-resolving condition, but potentially life-threatening
- Administration of 100% oxygen
- Antibiotic prophylaxis (amoxicillin + clavulanic acid)
- Observation and conservative treatment lead to resolution in 2 to 3 (up to 14) days in mild to moderate cases
- In severe cases tracheostomy may be necessary

Karras SC et al; Cervicofacial and mediastinal emphysema as the result of a dental procedure. J Emerg Med. 1996;149-13
Importance

- The significance of pneumomediastinum and the potential spaces is that severe and potentially life-threatening complications may occur.

  Frias Vilaça et al; Insights into Imaging. 2013;4:759
  Wakoh M et al; Dentomaxillofac Radiol. 2000;29:201
  Frühauf J et al; Arch Dermatol. 2005;Nov;141:1437

- "Danger space"

Complications: cardiac/pulmonary failure, air embolism, pneumopericardium, pneumothorax, pneumoperitoneum, optic nerve damage, infection/sepsis, compression syndromes

- Sandler CM, Libshitz HI, Marks G. Pneumoperitoneum, pneumomediastinum and pneumopericardium following dental extraction. Radiology 1975;115:539-540
- Rickles NH, Joshi BA. Death from air embolism during root canal therapy. Possible cause in a human and an investigation in dogs. J Am Dent Assoc. 1963;67:390

Wide range of differential diagnosis - hematoma, cellulitis, allergic reactions, angioedema, subcutaneous emphysema, necrotizing fasciitis, acute contact dermatitis, Melkersson-Rosenthal syndrome

Take home message

- Emergency condition
- Radiographs and CT to prove the diagnosis
- Wide range of differential diagnosis
- Usually self-resolving, but life-threatening complications
- Importance of the potential spaces for the spreading and outcome of the condition
References

3. www.exodontia.info/LudwigsAngina.html
Thank You!

I have a theory, but let’s wait for the x-rays.