**Acute Necrotising Sialometaplasia**

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**Introduction:** Acute Necrotising Sialometaplasia (ANSM) is a benign, rare and self-limiting inflammatory condition of salivary gland tissue which classically presents as a unilateral necrotic ulcer on the hard palate. The primary aetiology is trauma of minor salivary gland tissue which has been reported to occur following local anaesthetic infiltrations, surgery, heavy smoking, excessive alcohol consumption and violent vomiting such as in patients with bulimia. The most significant issue is that is may, both clinically and histologically, mimic malignancy which could potentially result in an incorrect diagnosis and unnecessary treatment. ANSM is self-limiting and usually heals spontaneously between 3-12 weeks without complication.

**Case description:** A 43-year-old Caucasian female was referred to the Oral and Maxillofacial Surgery department by her general practitioner following an eight-day history of a painful ulcer on the hard palate. Her medical history was unremarkable, and she was a non-smoker with a low alcohol consumption. On examination, there was a 1.0x1.5cm diameter 'punched out' ulcer on the left posterior hard palate which extended down to bone. An urgent incisional biopsy was undertaken which confirmed a diagnosis of ANSM and excluded dysplasia. The patient was reassured and subsequently discharged at an eight-week review following resolution of the lesion.

**Results and conclusions:** ANSM can present a diagnostic dilemma as it mimics malignancy both clinically and histologically. It is therefore vital that practitioners have an awareness of the condition and appreciate its benign and self-limiting nature to avoid unnecessary surgical intervention and patient distress. An urgent referral to a specialist in Oral and Maxillofacial Surgery or Oral Medicine is vital such that an incisional biopsy can be undertaken to confirm a diagnosis and exclude malignancy.

**Take-home message:** Clinicians should be aware of ANSM and understand the importance of an urgent referral to a specialist to exclude malignancy.

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**Inferior vena caval aneurysm - an unusual cause of back pain in a young girl**

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**Introduction:** Aneurysms are defined as an abnormal dilation of an artery, vein or cardiac chamber. Aneurysms affecting the inferior vena cava (IVC) are rare, with just over 50 cases in the published literature. They are associated with caval thrombosis. We will discuss the aetiology and management of such cases.

**Case description:** A 14-year-old girl presented to her local hospital complaining of a two week history of worsening back pain, swelling and discolouration of the legs, and reduced mobility. Imaging suggested a psoas abscess, and drainage was arranged at a regional paediatric centre. Upon review, repeat imaging was sought which indicated an IVC aneurysm rather than a psoas abscess. There was thrombosis within the dilatation extending to the femoral veins which accounted for her symptoms.

**Results and conclusions:** The patient was anticoagulated in the first instance. The duration of the symptoms meant it was too late for thrombolysis, and the occluded segment was considered too long for conventional venous stenting. She has been placed in compression hosiery and referred to the national centre for ongoing management.

**Take-home message:** Unusual presentations are often caused by rare pathologies. In any patient presenting with bilateral swollen, purple legs; it is imperative to establish if there is any venous occlusion. This was also an important lesson in being wary of draining supposed psoas abscesses in young patients.

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**New horizons in intraoperative diagnostics of cancer in image and spectroscopy guided pancreatic cancer surgery**

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**Objectives:** Currently, the primary treatment for solid tumors is the surgical resection. In the surgery, the complete surgical resection of the cancer tissues is essential to the prognosis of cancer patients. However, even in US, 40% of the cancer patients have the local recurrence in 5 years from the initial surgery, due to the failure to detect all the cancer tissues intraoperatively since cancers are highly heterogeneous in surface morphology and anatomical structures. We designed a novel visible/near-infrared (VIS/NIR) quantitative imaging method to help surgeons improve pancreatic cancer resection by providing quantitative intraoperative cancer diagnosis.

**Method:** All the clinical studies were performed according to an approved protocol by the Emory Institutional Review Board (protocol #: IRB00053609). Before the surgery, the patient receives an intravenous injection of indocyanine green (ICG). After 3-8 hours, the tissues of interest, are inspected intraoperatively with our lab-developed VIS/NIR imaging system. The VIS/NIR imaging system consists of two parts: a) a portable VIS/NIR camera imaging system for quick detection of potential cancers; b) a hand-held spectroscopic device for quantitative tissue assessment. Two IEEE 1394 cameras were assembled into an optical tube platform (Thorlabs, USA) to record VIS and NIR signals simultaneously.

**Results:** We have conducted dozens of clinical trials on human pancreatic cancer in Emory University Hospital and Saint Joseph’s Hospital in Atlanta, GA, USA. Over two hundred sample tissues from various pancreatic cancer surgeries, including distal pancreatectomy, Whipple procedure, and total pancreatectomy, were inspected with our imaging system. Within 1 sec, our device can quantitatively differentiate cancerous tissues from non-cancerous tissues intraoperatively: primary tumor and positive margins showed more than 200% stronger ICG fluorescence than normal tissues and negative margins did. The overall diagnosis accuracy of pancreatic cancer by our system is 93.7%.

**Conclusions:** In summary, we developed a comprehensive imaging system to provide surgeons with instantaneous (< 1 sec) cancer identification intraoperatively, compared to the traditional lengthy histopathological consultation (20-30 mins for intraoperative frozen section procedure with lower diagnosis accuracy, or hours-days for postoperative formalin fixed paraffin-embedded tissue preparation). Compared to the other reported imaging systems, our system has a unique advantage in providing quantitative NIR spectral analysis on the tissues of interest. This feature makes it possible to differentiate many tissues that current pre-vailing camera imaging systems cannot distinguish.

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