A 24 year old gentleman being treated for a right sided peritonsillar abscess presented with a 3 day history of blurred vision, dysphagia and hoarseness.

Imaging Findings:

A 24 year old gentleman presented to the accident and emergency department complaining of a 3 day history of blurred vision, dysphagia and hoarseness. He had been receiving oral antibiotic treatment for the previous 2 weeks for a right-sided peritonsillar abscess. On examination, the patient was found to have a tachycardia. Neurological examination revealed right VI, VII, IX, X, XI and XII cranial nerve palsies. The patient was otherwise afebrile and his SpO2 on air was 99%. Blood investigations showed a neutrophilia and elevated levels of inflammatory markers. A contrast enhanced CT scan of the head and neck was performed with showed right internal jugular vein thrombosis extending into the right sigmoid and transverse sinuses (Fig. 1). There was also partial obliteration of the right parapharyngeal space partly due to the presence of small volume lymphadenopathy in the right side of the neck. Subsequently, an MRI of the brain was performed which confirmed the above findings and showed fluid in the right mastoid air cells, suggestive of right sided mastoiditis, with abnormal meningeal enhancement around the right cerebellar hemisphere and in the region of the right tentorium cerebelli (Fig. 2). The patient was started on heparin and intravenous antibiotics. Cultures of blood drawn on admission grew a gram-negative anaerobic bacillus, which confirmed the provisional clinical diagnosis. During the patient's hospital stay, a CT pulmonary angiogram was performed due to the suspicion of pulmonary embolism yet this was negative. The patient's general condition improved and after 18 days he was discharged home.

Discussion:

Lemierre syndrome, also known as post-anginal sepsis or necrobacillosis, is a rare but potentially fatal complication of acute pharyngotonsillitis [1]. It was characterised in 1936 by Lemierre who made the connection between postanginal sepsis and anaerobic bacterial infections [2]. Unlike other gram-negative septicemias, which tend to occur in the chronically ill or elderly, Lemierre syndrome typically affects previously healthy adolescents with the mean age distribution for this condition being 15-18 years [3]. The organism most commonly isolated is Fusobacterium necrophorum. It is a strictly anaerobic, non-motile, non–spore-forming, gram-negative bacillus [4]. Typically, the syndrome of postanginal sepsis starts with a pharyngitis or peritonsillar abscess, followed by sepsis with high fever and rigors. Spread of infection from the peritonsillar tissue to the adjacent parapharyngeal space then occurs. It is the infection of this compartment that can cause complications such as thrombophlebitis of the internal jugular vein and severe sepsis with metastatic infections [5]. The parapharyngeal space is divided by the styloid process into an anterior (muscular) and a posterior (neurovascular) compartment. The posterior
neurovascular compartment includes the internal jugular vein, the carotid artery, the vagus nerve, lymph nodes, cranial nerves X-XII, and the cervical sympathetic trunk. The clinical findings of the invasion of this compartment result from compromise of these vital structures. Once the infection involves the internal jugular vein, it may cause bacteremia with haematogenous spread to other sites.

Diagnosis is primarily clinical and is dependent on a high degree of clinical suspicion. Referral to the radiology department may be for evaluation of symptoms caused directly by an internal jugular venous thrombus or for imaging of the septic embolic complications. The lungs are by far the most common metastatic targets (79.8%), followed by the joints (16.5%). The typical pulmonary findings in Lemierre syndrome are those resembling septic pulmonary embolism with chest X-ray findings of cavitating pneumonia, similar to what is seen in right-sided bacterial endocarditis with septic embolisation. Associated pleural effusions are common (43.1%) and may precede the appearance of pulmonary infiltrates. A normal chest X-ray is present in 19.2% of cases, and only 31.1% of patients had radiologic evidence of cavitation. Empyema and lung abscess may be seen, and both pneumatoceles and pneumothorax have been described.

The second most common sites of septic embolisation are the joints, with the hip, shoulders, and knees most frequently involved [6]. The frequency of joint involvement is 16.5%. Other sites of septic dissemination include hepatic or splenic abscesses (2.7%). However, splenomegaly and hepatomegaly are common (15.5%) and are not necessarily associated with liver or hepatic abscesses [7]. Meningitis, carotid thrombosis and mediastinal infection with pericardial tamponade may also occur. It should be kept in mind that a negative finding of internal jugular vein thrombosis does not exclude the diagnosis as it is only positive in approximately 21-36% of cases [8].

**Differential Diagnosis List:** Lemierre syndrome with meningitis and multiple cranial nerve palsies.

**Final Diagnosis:** Lemierre syndrome with meningitis and multiple cranial nerve palsies.

**References:**


Lemierre A (1936) On certain septicemias due to anaerobic organisms. Lancet


Description: Axial T1 weighted MRI of the brain with intravenous contrast showing asymmetrical meningeal enhancement at the level of the right cerebellar hemisphere. Origin:
Description: Axial T1 weighted MRI of the brain with intravenous contrast showing asymmetrical enhancement of the meninges in the region of the right tentorium cerebelli. Origin:
Description: Axial STIR showing fluid in the right mastoid air cells suggestive of right sided mastoiditis.
Origin:
Figure 2

Description: Axial contrast enhanced CT scan of the neck showing a filling defect in the right internal jugular vein with the signet ring sign indicative of right internal jugular vein thrombosis. There is also partial obliteration of the right parapharyngeal space. Origin:
Description: Axial contrast enhanced CT scan of the brain at the level of the cerebellum showing a filling defect in the right sigmoid sinus indicative of right sigmoid sinus thrombosis. Origin: