

## INTRODUCTION

Tuberculosis is a notifiable disease in Ireland as it poses a significant public health risk. Of the 241 cases of tuberculosis reported in quarter 3 (1<sup>st</sup> January – 30<sup>th</sup> September) in Ireland in 2017. The majority were pulmonary (61.4%) or a combination of pulmonary and extrapulmonary (5.4%). Extrapulmonary alone accounted for 29.9% of cases and of these 34.1% were extrathoracic lymphatic cases (Health Protection Surveillance Centre, 2017).

Several risk factors are recognised for the development of tuberculosis which include originating from or living in a high endemic region, immune suppression (due to illness or medication), substance abuse and direct contact. Tuberculosis cervical lymphadenitis (TCL) is the most common extrapulmonary presentation of tuberculosis worldwide (Chou et al., 2014). It frequently presents as a slowly enlarging non painful swelling and may be accompanied by systemic symptoms such as night sweats, fever, weight loss and fatigue. Clinical history and a range of diagnostic tests are used to establish the index of suspicion for TCL.

A unifocal cervical swelling presenting in the absence of any of the recognised risk factors or systemic symptoms of TCL poses a diagnostic dilemma for the clinician. This is particularly so in regions such as Ireland where tuberculosis is not endemic. TCL is 'notorious for mimicking' a number of other conditions such as lymphoma or cervical metastases (Chou et al., 2014).

However there are recognised stages (Figure 1) in the histopathological development of TCL (Hasan & Saeed, 2017), some of which can be recognised on ultrasound imaging and can help in establishing a strong index of suspicion for the diagnosis of TCL. Diagnosis can only be confirmed by obtaining microscopic or pathological proof through FNA +/- core biopsy. Given the prolonged and burdensome nature of the treatment for tuberculosis a strong index of suspicion or a confirmation of diagnosis is needed in order to commence therapy.

### The Histopathological Development of Tuberculosis Cervical Lymphadenitis

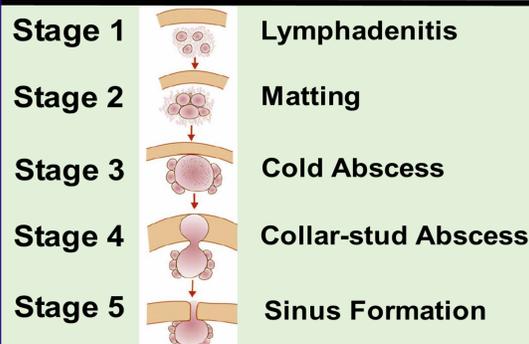
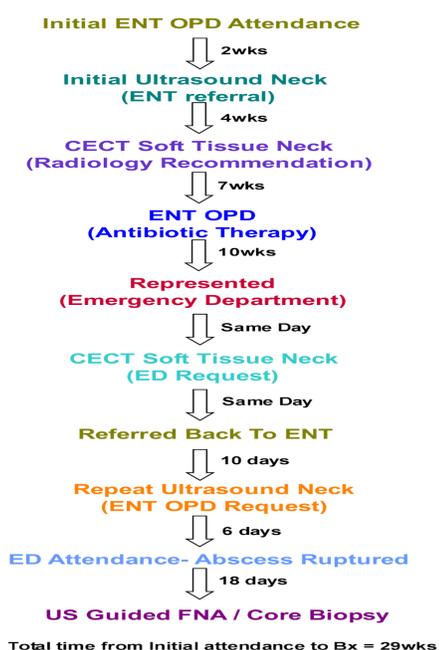


Figure 1: The 5 stages of TCL

## PATIENT BACKGROUND

44Y.O. male of sub Saharan African origin was initially referred by GP to ENT (Ear, Nose & Throat) Out Patients with intermittent non-painful swelling in the left lower anterior neck just superior to the proximal clavicle. The patient had no history of weight loss, ENT infections, night sweats or family or contact history with TB. He was otherwise fit and well. His chest x-ray and blood results were normal and he was referred for neck ultrasound.

## DIAGNOSTIC TIMELINE



## INITIAL ULTRASOUND EXAMINATION

The initial ultrasound examination identified a mixed echogenicity, predominantly hypoechoic lesion (Fig. 2 in the region of interest, with a small number of hyperechoic flecks within that were thought might represent air. The lesion was avascular. There was no cervical lymphadenopathy. A pharyngeal pouch could not be ruled out and a contrast enhanced soft tissue neck CT was recommended. The CECT performed 4 weeks after the ultrasound was normal, the lesion was not visible and there was no lymphadenopathy.

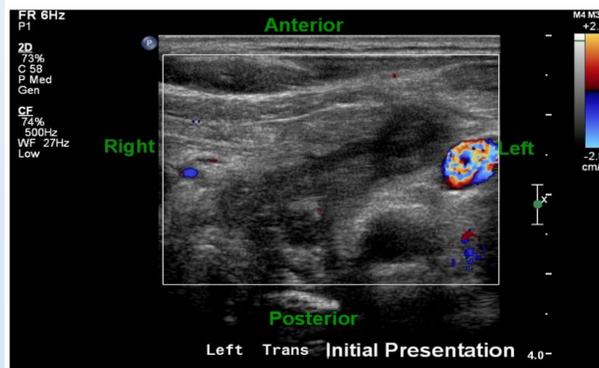


Figure 2. Mixed echogenicity, predominantly hypoechoic avascular lesion (retrospectively identified as Stage III)

The patient was followed up in ENT OPD and following treatment with antibiotics the lesion diminished in size.

## RECURRENCE

Ten weeks after discharge from the ENT OPD the patient represented through the Emergency Department (ED) with recurrent and increased swelling at the same site. The lump was fluctuant and non tender on palpation. There was no skin erythema. The patient was otherwise well. A repeat CT was performed (Fig. 3) that showed a midline soft tissue swelling, likely inflammatory in nature with no evidence of cervical lymphadenopathy and no features suspicious for malignancy. An OPD appointment was scheduled for neck ultrasound to further characterise the swelling.



Figure 3. CECT Soft tissue neck revealed a midline soft tissue swelling, with inflammation of the overlying subcutaneous fat and no lymphadenopathy.

## 2<sup>nd</sup> ULTRASOUND EXAMINATION

The 2<sup>nd</sup> US was performed 10 days after the CECT. There was a very superficial cystic lesion with a well defined wall which demonstrated vascularity on colour Doppler (Fig 4.).

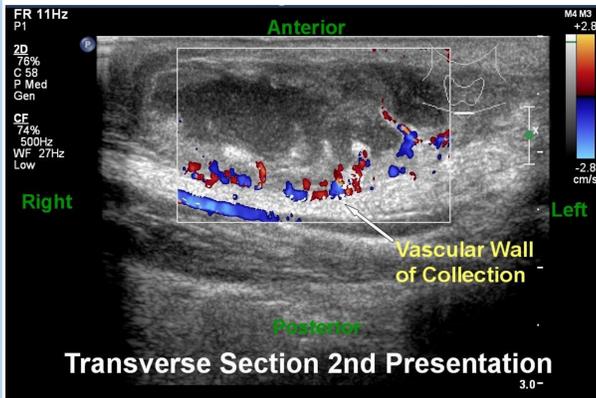


Figure 4. Transverse section of the cystic lesion with colour Doppler

There was posterior enhancement and multiple echogenic foci within (Fig 5.). The contents appeared thickened and murky. There was no evidence of cervical lymphadenopathy and the thyroid and other glands within the neck appeared normal. The cystic lesion extended above and separate from the isthmus of the thyroid and dipped between the strap muscles inferiorly anterior to the trachea. The classic appearance of a 'Collar Stud' cold abscess was evident demonstrating a hypoechoic tract formed as the collection migrated from the deep fascia to superficial subcutaneous region (Fig 6.)

## 2<sup>nd</sup> ULTRASOUND EXAMINATION (cont.)

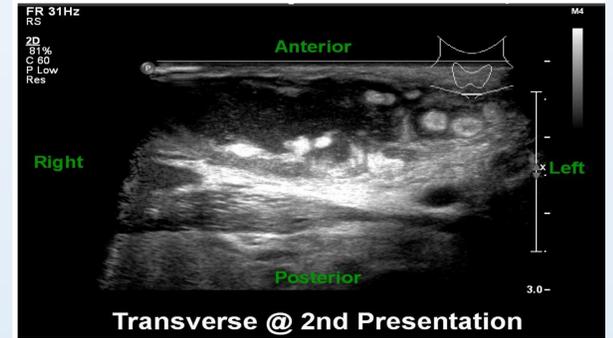


Figure 5. A transverse section in B-mode demonstrating echogenic foci within the lesion and posterior acoustic enhancement in the midline superior to the proximal clavicles.

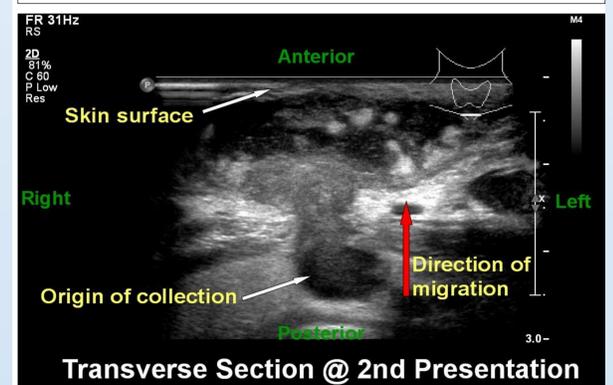


Figure 6. A transverse section in B-mode demonstrating the classic 'Collar Stud' appearance (Stage IV) with a hypoechoic fistula tract extending from the origin of the cold abscess to the cystic collection with echogenic foci within just inferior to the subcutaneous layer.

## US ON THE DAY OF BIOPSY

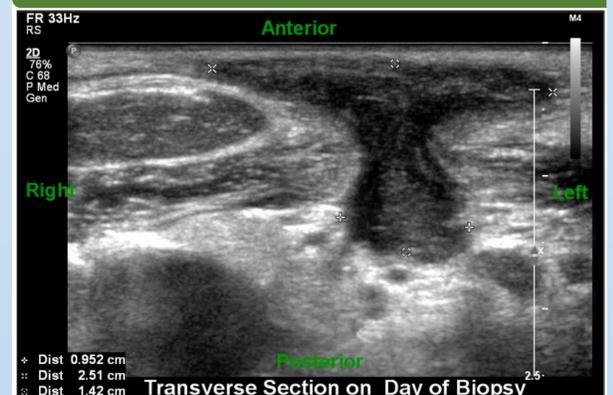


Figure 7. A transverse section in B-mode demonstrating the classic 'Collar Stud' appearance but no echogenic foci within on the day of the FNA & Core biopsy due to the fact the cold abscess had sinused to the surface (Stage V) in the interval and the caseous material within the lesion had discharged.

FNA failed to yield any aspirate so a core biopsy of the lesion was taken. The pathology report identified extensive granulomatous inflammation with caseation and a differential diagnosis of tuberculosis which was subsequently confirmed.

## DISCUSSION

All the ultrasounds were performed using a L17-5MHz high frequency transducer. Both B-mode and colour Doppler was used to characterise the lesion. Classic TCL ultrasound appearances are much more evident at Stage IV when the lesion takes on the Collar Stud appearance as it migrates to the surface. The bright echogenic foci within caused by hyalinosis in caseous necrosis are highly specific for TCL but are only evident in the later stages (Chou et al., 2014). This patient was otherwise asymptomatic and had no risk factors for TB other than country of origin on initial presentation. The unifocal nature of the presentation on imaging also made diagnosis difficult as there were no additional features identified that might have increased the index of suspicion for TB. The 2<sup>nd</sup> ultrasound examination yielded considerably more information for characterisation of the lesion than the CECT and along with the pathology results from the US guided core biopsy facilitated diagnosis and commencement of appropriate treatment. Prompt diagnosis of TCL is important to minimise the risk of TB transmission but it is not always straightforward. Awareness of the ultrasonographic features of the various stages of the disease process can help aid detection.

## REFERENCES

Chou, C.-H., Yang, T.-L. and Wang, C.-P. (2014) 'Ultrasonographic Features of Tuberculous Cervical Lymphadenitis', *Journal of Medical Ultrasound*, 22(3), pp. 158-163.

Hasan, S. and Saeed, S. (2017) 'Conventional and Recent Diagnostic Aids in Tuberculosis Lymphadenitis: a brief overview', *Asian J Pharm Clin Res*, 10(2), pp. 85-88.

Health Protection Surveillance Centre (2017) 'National TB Surveillance – A report by the Health Protection Surveillance Centre : Quarter 3 2017 TB Report', HPSC: Dublin.