Now you see, now you don't – A radiopaque neck mass?

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SUMMARY

Chest X-ray is valuable in the primary care setting in helping clinicians to confirm the underlying findings of the respiratory and cardiovascular systems. This view also includes the lower cervical vertebrae region which is helpful in elaborating the findings surrounding the neck. However, a single view of the film may sometimes cause confusion regarding the exact origin of the abnormal signs of the X-ray images. Thus, clinical correlation and application of 'rule of two' in X-ray imaging is definitely useful to clarify the findings and avoiding any misdiagnosis, medical errors and non-justifiable further investigations. Here we report a case of an 18-year-old female student with abnormal radiopaque neck mass seen from her chest the X-ray image. She was clinically well without any significant clinical findings. Surprisingly, the findings totally resolved after repeat the X-ray at two different occasions within the same week. This strange abnormal finding was later confirmed to be her hair tier. She was saved from unnecessary investigations for tuberculosis and thyroid disorder by repeating the X-ray (rule of two occasions). *Now you see, now you don't* of X-ray findings is indeed illogical and technical error needs to be rule out.

INTRODUCTION

Chest X-ray is commonly included as an assessment tool for medical check-up in primary care. However, it is important to understand that chest X-ray is not the final diagnostic investigation, and furthermore it is not applicable in all screening cases. Nevertheless, it has significant value when done on even in younger group of patients especially in endemic cases of tuberculosis, as X-rays enables the clinicians to pick up consolidation features even though the patient is asymptomatic.[1] Thus, X-ray is commonly included in the checklist before students are enrolled into public universities in order to safeguard public safety in the prevention of infectious disease.[2]

As such, every screening tool comes with a package of pro and cons. This include detection of unexpected lesions which might require further investigations. If the indications are not justified, patients will end up with further worries, waste of time, monies and energy for excessive follow up investigations.[3] For example, if a calcified mass is commonly found incidentally, especially on chest X-rays during medical check-ups, most patients end up with further unnecessary assessments that lead to longer and frequent exhaustive follow ups.[4] In fact clinical suspicion would be the main determining factor to repeat the imaging, in order to prevent time-wasting, unnecessary cost consumption and emotional distress to the waiting patient.

During plain radiograph image, x-ray beams are produced from x-ray tube that passes through body structures in between and this detected by a film detector. The x-ray beams are photons which are attenuated by the body structures while it passes through and the resulting radio-opacity is displayed by the film radiograph. Dense objects will cause more beam attenuation compared to lesser denser objects. Thus, calcifications in the body which are denser will appear more radiopaque compared to the lung field, which appear more radiolucent.[5]

In X-ray, radiopaque image on film reflects an object that are denser and able to block the radiation beams from passing it through. These objects could be metal, foreign body, bone, old infection and malignancy. Radiopaque neck mass may signifies infective cervical adenopathy, inflammatory adenopathy, congenital mass, benign and malignant neoplasm, and thyroid mass.[4] Nevertheless, the mass itself still can be an external object that has no relation with patient's disease. Thus, in a low risk of cases with grey area of unexplained suspicious diagnosis, rule of repeating the image is indeed important.

CASE REPORT

An 18-year-old female student came to the health clinic of Department of Family Medicine, International Islamic University Malaysia, Pahang, Malaysia for a medical check-up as a prerequisite before enrolling into the undergraduate program. She was otherwise asymptomatic and had no significant past medical and family history. Clinically, she was stable. There was no neck swelling or palpable mass.

However, her chest X-ray (Figure 1) showed a heterogeneous radiopaque mass on her left cervical area. She was suspected of having tuberculosis (TB) and nearly ended up being assessed for TB until our second opinion was sought by the attending colleagues. Clinically, there was no surrounding lesions detectable by us. Rather than exploring for the unidentified causes of the radiopaque mass by performing other investigations, we proceed first with repeating the X-ray and surprisingly the mass was absent in the repeated film (Figure 2).

Upon further questioning, the student admits that during the first X-ray, she was wearing a hair tier (band) that might be fell off down to the neck level, but unnoticed in view of

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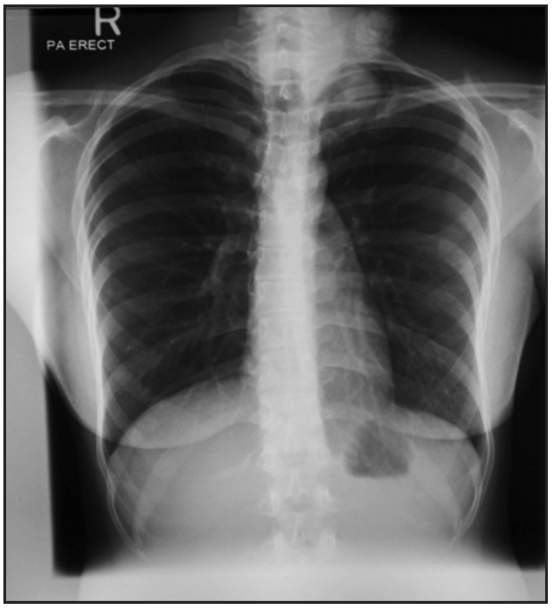

Fig. 1: Chest X-ray, posterior-anterior (PA) view during first visit. (Presence of dense well defined opacity at left neck region. It has extension into the left apical region of lung field).

Fig. 2: Repeated Chest X-ray. (Normal chest X-ray).

Fig. 3: Hair tier (band).

wearing a scarf. This was confirmed upon comparing the hair tier structure (Figure 3) and the 'calcified image' which exactly fit the size and shape of the image. She was then discharged after being reassured.

DISCUSSION

Adequate preparation by a radiographer is really important before proceeding with any imaging studies. These include by ensuring patient has removed all jewellery, removable dental appliances, eye-glasses and any metal objects or clothing that might interfere with the x-ray images.[5] This will give a proper clear image film and avoiding unnecessary artefacts that not only cause confusion to the clinicians, but also endangering the patients for subsequent unnecessary invasive procedures and investigations. Even though the artefacts are often unavoidable, they are seen as technical errors by radiographers, patient's factor or the presence of external or internal non-anatomical objects.[2,4]

Rather than focus on the result or the imaging films only, the clinical background of patient is indeed more important to be examined, if the image is that of the patient or the findings really corresponds to the clinical presentations of the patient. After adequate and complete clinical assessment to rule out possible differential diagnoses, also any technical error of the image or films still need to be rule out. Therefore, 'rule of two' in X-ray such as two occasions X-ray or two view X-ray films are indeed helpful in cases with incidental finding of abnormal images.[3,4]

Clinical neck masses indeed could arise from the skin of the neck, thyroid, fatty tissue, lymph node, cervical bone or vessels.[4] Nevertheless, neck mass from anteroposterior view of X-ray films could also arise from nearby external objects including the scarf and hair accessories. Thus, clarification from patients with adequate evidence from repeated images is indeed a practical approach in dealing with this possible issues in primary care level. Hair tier (band) is one of the structure that could consist of braid extension that may create a peculiar radio-opaque pattern on X-ray films, as in this case.

CONCLUSION

This case shows that abnormal X-ray images need to be repeated if technical error is suspected before other unnecessary assessment is done.

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