Incidental findings on a DXA scan: the unattended innocents
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Abstract
Dual energy X-ray Absorptiometry (DXA) scan is the gold standard for assessing and monitoring bone mineral density. Clear guidelines are given by ISCD and other societies as to the appropriate use of this modality. However, as with other imaging modalities, a DXA scan can reveal incidental findings that must be mentioned in the report. Often times an adequate history of the patient will define the cause of nonspecific artifact on DXA imaging underscoring the importance of appropriate history taking for scanning.

Keywords: Dual energy X-ray Absorptiometry (DXA), incidental, BMD (bone mineral density)

Case Image:

Fig 1: A 69 year old post-menopausal female with history of left breast carcinoma, had BMD evaluation. Lumbar spine images showed calcification in the right hypochondrium (arrow) corresponding to known gallstones.

Fig 2: A 62 year old post-menopausal female with history of backache, underwent a DXA scan for BMD evaluation. Lumbar spine images showed calcification in the right iliac fossa (arrow) corresponding to renal calculi.

Fig 3: A 59 year old post-menopausal female underwent DXA scan for BMD evaluation. Lumbar spine images showed linear...
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high density structure in the right hypochondrium (arrow) consistent with clips following laparoscopic cholecystectomy.

Fig 4: A 13 year old female, known case of thalassaemia minor, with history of bone pains was referred for BMD evaluation. Lumbar spine images showed visualisation of the soft tissue structures, liver, (arrow). In case of repeated transfusions iron overload can result in increased density and resultant visualization of liver on DXA scan.

Fig 5: An 80 yr old female, post-menopausal, known case of rheumatoid arthritis, with history of joint pains was referred for BMD evaluation. She also had a prior history of left foot fracture. The DXA scan showed at least three foci of calcifications in the pelvis which likely corresponded to calcified fibroids.

Fig 6: A 63 year old female, known case of left breast carcinoma underwent DXA scan for BMD evaluation. Large calcification in right hypochondrium was seen corresponding to known gallstones.

Discussion:
In a retrospective study conducted by A. Bazzocchi et al, incidental findings were discovered in 117 of 739 patients undergoing DXA scans, for an overall incidence prevalence of 15.8 %.1

In another study by Patrick Martineau at al, artifacts were reviewed and their effect was seen on BMD. Categories were made of those incidental findings that can lead to incorrect interpretation of DXA studies and others that do not affect BMD but may have relevance to the patient’s medical condition.2 Extra-osseous calcifications represent underlying pathophysiological conditions. Patrick et al added that the cause of erroneous BMD is probably due to software-version specific correction of BMD by subtraction when there is an overlap with boney ROIs.

BMD values in our listed patients did not seem to have been affected by the presence of non-osseous calcifications, eg cholelithiasis, nephrocalcinosis and metallic artefacts namely surgical clips.

Contrary to other cases, case 4 highlights an interesting possible use of DXA imaging in Thalassaemia patients where due to repeated transfusions iron overload may lead to increased density, hence increased visualization of the liver on DXA scanning. This may have caused decrease in overall BMD in this patient, with a Z score of -8.5. Chatterton et al use DXA to scanning to show that the liver density measured on DXA scanning correlated will with serum Ferritin levels of Thalassaemia patients.3

The reporting physician is responsible for mentioning all incidental findings seen within the imaged field of view. Although this may or may not affect management of the patients, the incidental findings have always had an impact on health economy, increasing time spent to analyze imaging examinations or needing further examinations to reach a final diagnosis.3

References