International Journal of Orthopaedics and Rheumatology
Online ISSN: 2664-9705, Print ISSN: 2664-9691
Received: 01-11-2018; Accepted: 02-12-2018; Published: 02-01-2019
www.orthopaedicsjournal.net
Volume 1; Issue 1; 2019; Page No. 01-02

Sternum in ankylosing spondylitis resembling 'Dagger sign' in spine: A case based observation

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DOI: https://doi.org/10.33545/26649691.2019.v1.i1a.1

Abstract
There are several characteristic clinical and radiological features associated with ankylosing spondylitis that help in the diagnosis of this debilitating condition. The dagger sign is one of the described radiological sign resulting from fusion of contiguous spinous processes forming a dagger like appearance. Sternum, with fused manubrio-sternal or xiphisternal joints in advanced disease, can also look like a dagger that is often underappreciated. We highlight this often overlooked 'dagger' to be acknowledged and further evaluated as associated entity of this spondyloarthropathy.

Keywords: sternum, ankylosis, Manubriosternal joint, Xiphisternum, fusion, dagger sign

Introduction
Ankylosing spondylitis (AS) is debilitating spondyl oarthopathy characterized radiologically by gradual progressive ankylosis affecting axial and appendicular skeleton. Radiographic signs include gradual ossification of spinal ligaments which ultimately leads to flowy ankylosis of vertebrae in late stage also termed as 'bamboo spine'. The ossified fusion of contiguous spinous processes on anteroposterior view as sclerosed, white structure resembles a dagger and thus is also referred to as 'dagger sign'(Fig 1). This sign is among several well described radiological signs in ankylosing spondylitis.

Case report
A 60-year-old male presented for hip pain as a known case of ankylosing spondylitis with his back in fixed, stooped posture. There was inability to flex or extend the spine and the chest expansion was also less than 1 cm. There was completely fused sacroiliac joints in the pelvic radiographs along with ankylosing bilateral hip joints with degenerative and secondary arthritic changes. The spine showed calcified spinous process making a continouous sclerotic structure that is often referred as dagger sign while there was flowy ankylosis along the vertebrae characteristic of ankylosing spondylitis known as bamboo spine (Fig.1).The affliction of sternum in ankylosing spondylitis is often not recognised partly because less attention is given to it along with the fact that conventional spine lateral views usually omit sternum as part of a developed film. We hereby revisit fusion of manubrio-sternal and xiphisternal joints which also take place in the late ankylosing spondylitis. The fusion of these joints may result in a sternum that appears as single bony structure that could be strikingly distinguished from sternum in otherwise normal person (Fig.2). The sternum though appears as a dagger in the lateral spine radiograph. In other words, we can say that there are two daggers present in radiological evaluation of late stages of the disease.

Fig 1: The radiographs showing flowy and fused vertebrae or 'bamboo spine' (denoted by arrows) and the white long sclerotic dense structure following fusion of spinous processes called 'dagger sign' (denoted by star).

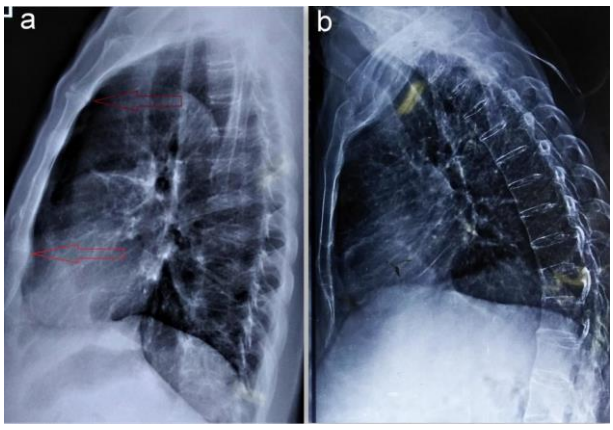

Fig 2: The sternum of a normal patient (a) with manubrio-sternal (upper arrow) and xiphi-sternal articulations(lower arrow) when compared to appearing as single bony structure without those articulations in a patient with ankylosing spondylitis (b).

Discussion

Manubrio-sternal and xiphisternal are two key axial joints of sternum. These joints also show involvement with periarticular calcification and blurred joint margins with or without visible swelling[1,2]. This, however, may undergo gradual ankylosis that is evident in the late stages often in tandem with the abovementioned 'bamboo spine' and 'dagger sign'. We also incidentally noticed the changes in the sternum as the sternum was visible in spine radiographs. Literature is scarce with regard to the true incidence of manubrio-sternal ankylosis but a large number of patients are supposed to have associated manubrio-sternal involvement in ankyosing spondylitis [3]. The costochondral joints are usually affected in ankylosing spondylitis and that clinically presents as decrease chest expansion as an important clinical feature. The rigid sternum may also, to some extent, may add to the overall decreased chest movement. The underlying etiopathological changes and exact biomechanical implications of manubrio-sternal ankylosis would require further studies but this hidden feature which may be another important association in the disease evolution.

Acknowledgement - None
Conflicts of interest - None

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