

Bilateral Ankylosis of Sacroiliac Joints with Complete Ossification of Ventral Sacroiliac Ligaments: a Case Report

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ABSTRACT

Introduction: the Sacroiliac joint is a diarthrodial type of joint formed by the articulation of sacrum and innominate bones. It is strengthened by the strong extrinsic and intrinsic ligaments like sacrotuberous, sacrospinous, and ventral & dorsal sacroiliac ligaments. The sacroiliac joint transmits the body weight to the lower limbs through the sacrum and innominate bones. Ossification of the ligaments gains its importance in treating conditions like ankylosis and other degenerative diseases of the joint. The present case describes bilateral ankylosis with complete ossification of the ventral sacroiliac ligaments in a male bony pelvis. Such ossifications can lead to painful and restricted movements of the pelvic joints. Clinical knowledge of such an unreported anatomical variant can be helpful for radiographic interpretations, to diagnose and treating cases of compression syndromes and chronic pain.

Keywords: Ankylosis; Sacroiliac joint; Sacrum; Iliac bone; Ventral Sacroiliac ligament.

Introduction

The sacroiliac joint (SIJ) is one of the largest and most stable joints. It is a diarthrodial type of joint with two types of articulations, the first one is between the sacrum & ilium (anteroinferior synovial type of joint) and the second is a posterosuperior syndesmosis type of joint between the interosseous surfaces of the ilium and sacrum. The restricted movement of the joint is due to the irregular articular surfaces. The strong posterior ligaments prevent the downward pull of the sacrum during forced movement of the trunk & the iliolumbar ligaments resist the displacement of the fifth lumbar vertebra over the sacrum. The strong sacrotuberous & sacrospinous ligaments oppose the upward movement of the sacrum¹. In 1949, Testut & Laterjet modified the description of the SIJ as that which contains a freely mobile ventral component and an ossified dorsal component, they coined it as “diarthro-amphiarthrosis” type of joint which is characterized by both as a freely movable joint (diarthrosis) and an ossified joint (synarthrosis)². During pregnancy, the pelvic ligaments loosen up making the sacroiliac locking mechanism less effective thus, permitting more rotational movement & allows alterations of the pelvic diameter during labor². Thus, in most of the cases of ankylosis reported the male bony pelvis is commonly involved, including in this case. Solonen in 1957 reported that older men & women showed decreased SIJ mobility due to the onset of ankylosis or fusion of the joint causing pain and inflammation of the joints³. The SIJ is very strong due to the presence of extrinsic and intrinsic ligaments. The sacrotuberous & sacrospinous ligaments are extrinsic ligaments whereas; the ventral and dorsal sacroiliac ligaments and interosseous sacroiliac ligaments are

intrinsic. These ligaments influence the movements and maintain the stability of the SIJ⁴.

Case report

During the routine Osteology tutorial class for undergraduate medical students in the department of Anatomy, JSS Medical College, Mysore, Karnataka state, India, the author observed the bilateral ankylosis of the SIJ with complete ossification of ventral sacroiliac ligaments in a dry bony male pelvis. No other ligaments were found to be ossified. The junction between the left border of the sacrum and ilium had to be manually broken to articulate the bony pelvis for studying purposes. The male pelvis was studied from all aspects; the ossified ligaments were measured using a measuring tape and photographs were taken (refer figure 1). The length of the ossified right ventral sacroiliac ligament was 9.4 cms and the ossified left ventral sacroiliac ligament was 10.6 cms long. No other abnormalities were noted in the male bony pelvis.

Discussion

The ventral sacroiliac ligament is composed of dense connective tissue that extends from the ala of the sacrum to the ilium; this is the modified part of the anterior aspect of the joint capsule. In the area between the Psoas major & obturator internus lies the lumbosacral trunk (L4 – L5 fibers) and obturator nerve in close relation to the ventral sacroiliac ligament. Major blood vessels like iliac artery and vein are also in close vicinity to the ventral sacroiliac ligament². Bilateral ossification of the ventral sacroiliac ligaments as seen in our case can cause compression of these nerves and blood vessels leading to signs of



Figure 1. anterosuperior view showing the male bony pelvis with bilateral ankylosis and ossification of both ventral sacroiliac ligaments. a: Ossification of Right ventral sacroiliac ligament (RVSIL); b: Ossification of Left ventral sacroiliac ligament (LVSIL); c: Manually broken to articulate the bony pelvis.

compression syndrome. Fibrous adhesions & gradual obliteration occur in old age especially among females after menopause. The joint may become completely fibrosed and occasionally ossified in a few cases⁴. Ankylosis of joints can lead to ankylosis spondylitis with inflammation of the joints involving the axial skeleton. This can cause fibrosis and joint fusion with associated immobility and kyphosis. The SIJ is most commonly involved joint (100%), followed by intervertebral joints (75%), shoulder joints (30%) & knee joints (20%), it can involve the temporomandibular joint also⁵. Cases of sacroiliitis causing ankylosis of the SIJ due to inflammation and gradual ossification of the ligaments have been reported in radiographic studies^{6,7}. Histopathological changes like para-articular osteophytosis is seen in ankylosis, which is an important feature of degenerative sacroiliac disease & seen more commonly among males. Sacroiliac ankylosis is less common among females due to increased mobility during childbirth^{8,9}. Bhanu SP & Sankar DK in 2011 reported a case similar to our findings in one of the dry male pelvis showing bilateral ankylosis of SIJ with ossified sacrospinous ligament, sacrotuberous ligament, and transverse acetabular ligaments. The anterior and posterior sacroiliac ligaments of both the SIJ were also ossified⁶. Arvind KP *et al*

2015 observed a case of ankylosis of right SIJ with complete ossification of the anterior, posterior & interosseous sacroiliac ligaments of right SIJ in a dry male pelvis¹⁰. Singh R 2015 observed partial ossification of the anterior sacroiliac ligament on the left side of a dry male pelvis. The right SIJ was not ossified. All the other ligaments did not show any signs of ossification and there was no ankylosis of the SIJ¹¹. The ossification of the ventral sacroiliac ligament and coccygeal sacralization has been caused by the modulated effect of Hox 11 group of genes¹² and Pax 1/Pax 9 paralogous genes¹³.

Conclusion

Such a rare variant of bilateral ankylosis and ossification of bilateral ventral sacroiliac ligaments has not been reported in the previous literature hence its knowledge is necessary for radiographic interpretations and to accurately diagnose cases of dysfunctional SIJ. Ossification of ligaments may compress over the neurovascular bundles in the nearby vicinity leading to compression syndromes and other complications like chronic pain. The previous few cases that have been reported are more common amongst men indicating that ankylosis is less common among women due to increased pelvic mobility, especially during childbirth.

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