

## *International Journal of Scientific Research and Reviews*

### **Ossified Transverse Acetabular Ligament of Hip Bone- A Case Study.**

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DOI - <http://doi.org/10.37794/IJSRR.2023.12304>

#### **ABSTRACT**

Ossified transverse acetabular ligament is a rare anatomical variation. It converts acetabular notch into a foramen. The ossification of transverse acetabular ligament limits the movements of the hip joint. It may compress the nutrient vessels to head of femur leading to its necrosis. Knowledge of this ossified ligament is important for radiologists and orthopaedic surgeons performing total hip replacement. We are reporting a case of ossified transverse acetabular ligament in a left sided hip bone belonging to a post-pubertal female. We have measured and reported the dimensions of the ossified ligament as well.

**KEYWORDS:** Transverse acetabular ligament, hip bone, ossification, compression, hip replacement.

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## **INTRODUCTION**

Acetabulum is a cup shaped depression in hip bone resulting from union and subsequent fusion of ilium, ischium and pubis. The acetabulum receives the head of femur to form the hip joint. The periphery of acetabulum gives attachment to a fibro-cartilaginous rim known as acetabular labrum. The acetabulum presents a notch inferiorly which gives attachment to transverse acetabular ligament at its two ends. The gap between the transverse acetabular ligament and acetabular notch gives passage to obturator and medial circumflex femoral vessels which serve as nutrient vessels to the head of femur. The transverse acetabular ligament may get ossified that converts the acetabular notch into a foramen. This limits the movement of the hip joint and compresses the nutrient vessels of head of femur leading to its necrosis<sup>1</sup>. The base of ligamentum teres femoris fuses with the transverse acetabular ligament. The ligamentum teres femoris is hypertrophied in patients with developmental dysplasia of hip (DDH). In such cases the repeated tractions of the ligamentum teres femoris results in hypertrophy of transverse acetabular ligament. This may decrease the size of acetabular fossa and prevent reduction of hip joint<sup>2</sup>. The transverse acetabular ligament is utilized for orienting acetabular component in total hip replacement surgery<sup>3</sup>. So the knowledge of ossified transverse acetabular ligament will be relevant in radiological procedures and transplant surgeries involving the hip joint.

## **CASE REPORT**

The authors chanced upon a left sided hip bone presenting with ossified transverse acetabular ligament during routine osteology classes of first year MBBS students in a Medical College of Eastern India. The hip bone belonged to a post-pubertal female (hip bone fully formed with ossified triradiate cartilage, angle of greater sciatic notch more than 90°, triangular obturator foramen, out-turned ischial spine<sup>4</sup>). The ossified transverse acetabular ligament resulted in the conversion of acetabular notch into a foramen (Figure 1). The dimensions of the ossified structure and acetabulum were measured with slide caliper and found to be as follows-

- (A) Ossified transverse acetabular ligament- Maximum length- 2.7 cm, maximum breadth- 1 cm, maximum thickness- 0.4 cm.
- (B) Acetabulum- Vertical diameter- 4.3 cm, transverse diameter- 4 cm.



FIGURE 1: Photograph of hip bone showing ossified transverse acetabular ligament (TAL)





FIGURE 2: Photograph of hip bone showing acetabular notch converted to a foramen (AN)

## **DISCUSSION**

We have reported the ossification of transverse acetabular ligament in a left sided female hip bone. Perumal and Sathiya<sup>1</sup> have reported frequency of ossified transverse acetabular ligament as 14% on right side and 11.4% on left side. A total frequency of 12.6% (on both right and left side) was reported in their study. The average length, breadth and thickness of the ossified transverse acetabular ligament were reported as 1.5 cm, 0.9 cm, 0.4 cm on right side and 1.6 cm, 1.1 cm, 0.5 cm on the left side respectively on the study conducted by them. Bhanu and Devi Sankar<sup>5</sup> have reported one male pelvis showing bilateral ankylosis of sacro-iliac joint with ossification of sacro-spinous ligament, sacro-tuberous ligament and transverse acetabular ligament. In their study, the maximum length of the ossified transverse acetabular ligament was observed to be 3.6 cm on right side and 3.5 cm on left side whereas the maximum width of the ossified ligament was observed to be 1.4 cm on right side and 2.1 cm on left side.

The ‘anterior pelvic plane’ is the foundation of image based hip navigation technique. In this method, transverse acetabular ligament is used as one of the parameters to determine the inclination and version of acetabulum. If the transverse acetabular ligament is ossified, registering bony landmarks through the ossified ligament becomes ambiguous and cumbersome<sup>6,7</sup>. In open surgical hip dislocation, the ligamentum teres femoris is separated at the point of its attachment to transverse acetabular ligament. This procedure becomes difficult if the transverse acetabular ligament is ossified<sup>8</sup>.

## **CONCLUSION**

Ossified transverse acetabular ligament poses challenges in image based hip navigation technique and total hip arthroplasty. So the pronable presence of ossified transverse acetabular ligament should be considered in cases of difficult image based hip navigation and hip arthroplasty.

**Ethical clearance- not required. Conflict of interest- declared none. Funding received- None.**

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