

## Dystrophic calcification in obliterated umbilical artery

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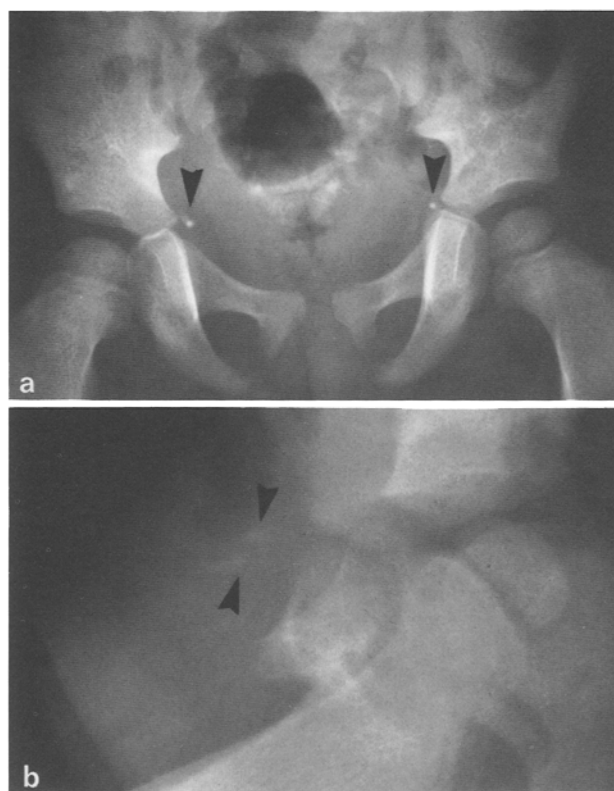
**Abstract.** Evidence is presented that calcification may occur within the horizontal pelvic portion of the obliterated umbilical artery and that the finding may be visible on abdominal radiographs.

There are several vascular structures that are patent during fetal life and undergo spontaneous obliteration soon after birth. They include the ductus arteriosus, umbilical vein, ductus venosus, and the umbilical arteries. These structures persist in adult life as fibrous cords, referred to, respectively, as ligamentum arteriosum, ligamentum teres or round ligament, ligamentum venosum, and lateral umbilical ligament (umbilical artery ligament). It has been shown that during the process of obliteration, the ductus arteriosus may develop dystrophic calcification within its lumen, and the resulting calcification of the ligamentum arteriosum may be visible on routine chest radiographs [1]. A similar calcification within an obliterated umbilical vein, ductus venosus, or umbilical artery has not been reported to our knowledge. In this paper we present evidence that dystrophic calcification may occur also within the umbilical artery ligament and may produce an image visible on abdominal radiographs.

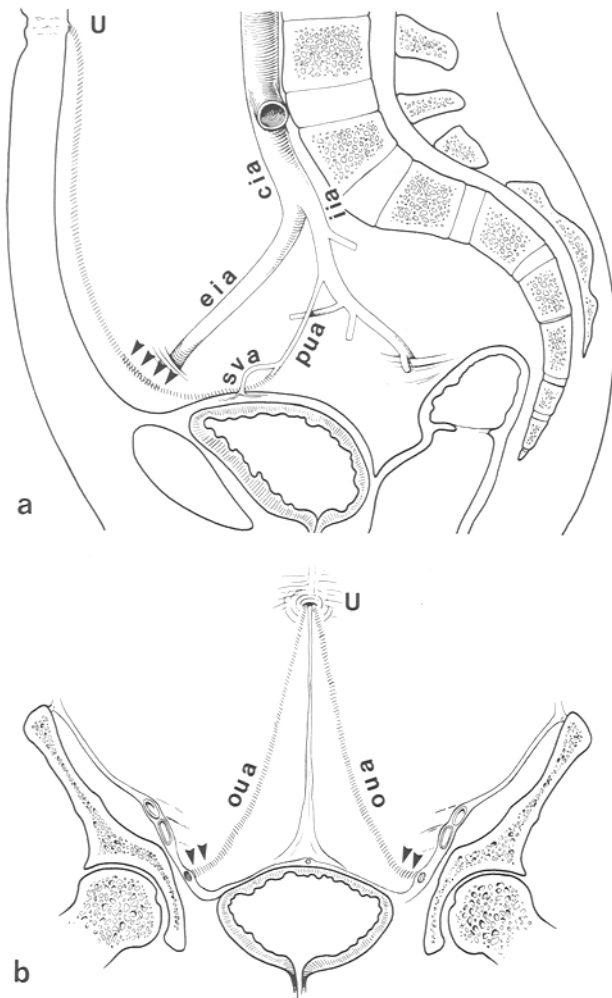
### Radiographic material

We have observed three children, aged 2, 2½ and 3 years respectively, with an unusual pelvic calcification demonstrated on abdominal radiographs. The calcification was bilateral in the first patient (Fig. 1), and was limited to the left side in the other two. In all three cases, the calcification was visible both in the frontal and in the lateral projection. In the frontal projection, it was quite dense, measured about 2 mm in size, and was located laterally in the pelvis near the junction of the iliac, ischial and pubic bones. In the lateral projection, it was quite faint, linear, and

about 1 cm in length and 1-2 mm in width. It was directed anteroposteriorly and projected slightly above the pubic symphysis. It was suggested, based on the location and appearance of the calcification in the two roentgen projections that the finding most likely represented dystrophic calcification within the horizontal pelvic segment of the umbilical ligament. The corresponding anatomic segments of the obliterated



**Fig. 1 a and b.** Roentgenograms of the pelvis in a 2-year-old child showing bilateral pelvic calcifications, believed to be in the horizontal pelvic segment of obliterated umbilical arteries. **a** In the frontal projection, the calcifications are located near the junction of the iliac, pubic and ischial bones (arrowheads). **b** In the lateral projection they are located anteriorly and project slightly above the pubic symphysis (arrowheads)



**Fig. 2a** Mid-sagittal section of the lower abdomen showing the right common iliac, external iliac, internal iliac, persistent umbilical and superior vesical arteries. The obliterated part of the umbilical artery (interrupted line) extends from the umbilicus (U) to the origin of the superior vesical artery (sva). The arrowheads point to the horizontal, pelvic segment of the obliterated umbilical artery, at the same site as the calcifications seen in the 3 children reported in this paper. **b** Coronal section of the lower abdomen showing the course of the obliterated umbilical arteries (oua) on the inner surface of the anterior abdominal wall. The arrowheads point to the horizontal pelvic portions of these structures, at the same site as the calcifications described in the 3 children reported in this paper

umbilical arteries are indicated in Figure 2 (arrowheads).

### Histologic material

In an attempt to determine whether calcification within obliterated umbilical artery actually occurs, we obtained segments of the umbilical artery ligament, at the time of autopsy, from seven infants aged 7 days, 12 days, 8 weeks, 5 months, 12 months, 14 months, and 23 months. All the specimens were



**Fig. 3.** Longitudinal section of an umbilical artery ligament obtained at autopsy in a 12 months-old infant showing a nidus of dystrophic calcification in the obliterated lumen. Hematoxylin-eosin stain

from the horizontal pelvic portion of the umbilical artery at the same level as the calcifications described above (Fig. 2, arrowheads). Longitudinal and transverse sections were obtained from each specimen and were stained with hematoxylin and eosin. Calcification within an obliterated umbilical artery was demonstrated in 2 of the 7 patients (aged 5 months, and 12 months). An example of this finding is shown in Figure 3.

### Conclusion and summary

The findings indicate that dystrophic calcification in the obliterated pelvic portion of the umbilical artery can occur, and there is strong suggestive evidence that this calcification may be visible on pelvic radiographs. Phleboliths and distal ureteral calculi may present as lateral pelvic calcification but they are located posteriorly, and phleboliths often have a central radiolucency and are rare in children [2]. Whether calcification can occur also in other parts of the umbilical artery ligament is not proven or excluded by this study.

### References

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2. Marguis JR (1977) The incidence of pelvic phleboliths in pediatric patients. *Pediatr Radiol* 5: 211

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