

## Congenital Splenic Anomalies in a Child: Incidental Ultrasonographic Findings and a Case Report

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**Abstract:** The spleen is the largest encapsulated lymphoid and intraperitoneal organ in the human body located in the left hypochondrium, and consisting of the white pulp for the immune system and the red pulp for phagocytoses of blood elements. Congenital anomalies of the spleen may vary, ranging from those of the shape, size and location, among which are lobulation, clefts and notches, accessory spleen, wandering spleen and polysplenia. This is a 10-year-old male child referred for an abdominal and pelvic ultrasonography on account of urinary infection (UTI), had no history of trauma and instrumentation to the abdomen or left hypochondrial region. The abdominopelvic ultrasonogram showed a normal sized spleen with a diameter of 110mm, that showed a deep and central fissure extending superior and right medially on the diaphragmatic surface of the spleen. Linear echolucent areas are also demonstrated bilaterally; fissures, multiple notches are also noted on the superior border and clefts; appearing as linear echolucent areas on the superior border dividing it in to lobules. These clefts measure about 2cm from the superior border of the spleen. No accessory or multiple splenic tissues or wandering spleen is however demonstrated. The abdominal organs show normal situs. We report the ultrasonographic appearance of congenital anomalies involving the shape of the spleen in a 10-year-old child due to its peculiar presentation.

**Keywords:** Abdomen, Congenital, Spleen, Clefts, Notches.

### INTRODUCTION

Spleen is regarded as the largest organized lymphoid organ in the human body, and appear as a wedge-shaped structure with two surfaces; the smooth diaphragmatic surface in contact with the diaphragm, and the rough visceral surface in close contact with abdominal organs and located in the left hypochondrium [1-3].

Spleen develops as a mass of mesenchymal cells within the dorsal mesogastrium in the 6<sup>th</sup> week of intrauterine life, and shows lobulation within the fetal life, though this lobulation may persist in adult life as superior notches [1, 3].

The splenic notches or clefts originally separates the fetal lobules, may persist in adult life and may be as deep as 2-3cm, often sharp, and can be misdiagnosed as splenic laceration in patients with trauma to the abdomen [4-6].

Splenic notches and clefts are regarded as forms of congenital shape anomalies often located on

the diaphragmatic surface and especially superior border of the adult spleen [6, 7].

The spleen has been reported to show variation in size, shape and position with respect to age, sex and other factors of each individual [3, 8, 9].

Deep fissures on the diaphragmatic surface of the spleen have been reported, extension of deep fissures to the diaphragmatic surface occur as rare event and seen in about 1% of cases [4, 10, 11].

Lobular spleen, congenital variant of shape of the spleen has no pathological consequence on the spleen or its function as reported by some authors [12, 13].

Congenital splenic anomalies are diagnosed following imaging, these are ultrasonography, contrast enhanced computed tomography, magnetic resonance imaging and Tc-99m scintigraphy, these demonstrate the location, shape and number of spleens in the abdominal and pelvic cavities [4, 6, 7, 12, 14].

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## CASE REPORT

This is a 10-year-old male child that was referred for abdominal and pelvic ultrasonography on account of mild abdominal discomfort and not related to any splenic condition.

The patient is conscious and alert, well oriented, not pale, not dehydrated, anicteric, not cyanosed, no finger clubbing, and not in obvious painful or respiratory distress. No masses or area of tenderness demonstrated following abdominal examination and palpation.

The patient had no history of trauma or instrumentation done to the abdomen/ and left hypochondrial region, no history of any obvious congenital anomaly in the family.

The patient had a normal packed cell volume of about 36%, normal white cell count of about 8500/mm<sup>3</sup>, normal ESR of about 7mm/hr.

The blood pressure was about 90/50mmHg, the pulse rate was 82beats per minute with a normal respiratory rate of about 12cycles per minute.

The patient had normal blood electrolyte, urea and creatine levels, with a normal urinalysis and a normal urine and stool microscopy that yielded no growth of any organism.

The abdominal and pelvic ultrasonogram showed normal sized spleen with a longitudinal

diameter of about 110mm, this spleen however showed a central deep fissure that extends to the superior and right medial aspect of the spleen, other laterally located linear echolucent areas; fissures, superior notch-like irregularities; notches, with faint linear echolucent lines separating folds of splenic tissues superiorly giving the spleen a lobular appearance; the lobules (figures 1&2). These areas were further interrogated by Doppler scan and showed no flow to rule out vessels.

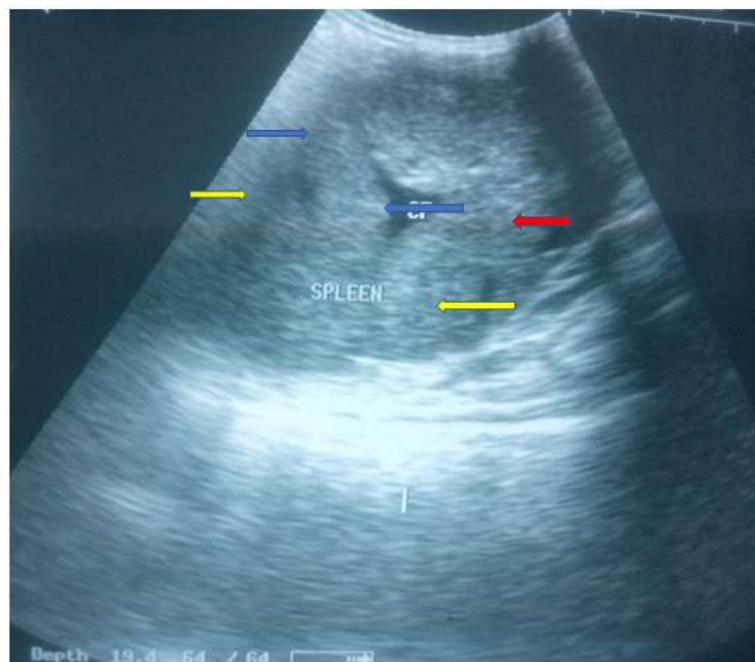
The remaining abdominal organs showed normal appearances, with no abnormal abdominal situs and accessory or multiple splenic tissues in the abdominal cavity.

The pelvic ultrasonogram showed normal bladder; walls and content with no feature of bladder stones or masses.

A diagnosis of splenic anomalies; fissures, clefts, notches and lobules following ultrasonography in a 10-year-old male child were proffered.

The parents and patient were reassured, the significance of the splenic anomalies was highlighted and explained that it only has a cosmetic significance and does not affect the pathologic function of the spleen.

We report a case of ultrasonographically diagnosed congenital anomalies involving the shape of the spleen; fissures, clefts, notches and lobules in a 10-year-old male.



**Fig-1: An abdominal ultrasonogram showing the spleen (normal sized with a longitudinal diameter of about 110mm) with a central deep fissure (CF; left blue arrow) extending to the superior and right medial aspect of the spleen (right blue arrow), linear hypoechoic spaces at the medial aspect of the spleen (other fissures; right and left yellow arrows) with notches on the superior margin/border of the spleen (left red arrow)**



**Fig-2: An abdominal sonogram of the spleen demonstrating the notches (left red arrow) and clefts (left blue arrow) at the superior border extending in to the substance of the spleen, giving the superior border a lobular appearance (left yellow arrows). The aforementioned fissures are also demonstrated**

## DISCUSSION

Spleen develops as a mass of mesenchymal cells within the dorsal mesogastrium in the 6<sup>th</sup> week of intrauterine life, and shows lobulation within the fetal life, though this lobulation may persist in adult life as superior notches [1, 3]. The index case has a normal sized and normal situated spleen but shows lobulation in its superior border in conformity to these literatures.

The splenic notches or clefts originally separates the fetal lobules, may persist in adult life and may be as deep as 2-3cm, often sharp, and can be misdiagnosed as splenic laceration in patients with trauma to the abdomen [4-6]. The index case had notches and clefts with lobules in the superior margin of the spleen. The clefts were faintly seen and are as deep as 2cm from the surface of the spleen, thereby conforming to these literatures.

Deep fissures on the diaphragmatic surface of the spleen have been reported, extension of deep fissures to the diaphragmatic surface occur as rare event and seen in about 1% of cases [4, 10, 11]. The case under review also had a deep centrally located fissure and seen extending superior and right medially, thereby conforming to these literatures.

Lobules, clefts and notches of the spleen, are regarded as congenital variants of shape of the spleen and has no pathological consequence on the spleen or its function as reported by some authors [12, 13]. The index case had no complaint with respect to splenic pathology, and the baseline blood examination was also normal, thereby conforming to these literatures.

The lobules of the spleen may occasional extend medially anterior to the upper pole of the left kidney and less often posterior to the upper pole of the left kidney, these close relations may be misinterpreted as a mass originating from the kidney [4, 6, 7]. The Close relations of the lobules to the upper pole of the left kidney was however not demonstrated in the index case invariance to these literatures.

Congenital splenic anomalies are diagnosed following imaging; these demonstrate the location, shape, location and number of spleens in the abdominal and pelvic cavities [4, 6, 7, 12]. The case under review had abdominal ultrasonography; this demonstrated the clefts, notches, lobules and fissures thereby conforming to these literatures.

Following imaging, absence of free abdominal or perisplenic fluid and normal splenic enhancement are key imaging features that differentiates splenic variants; clefts, notches and lobulation from an area of laceration [14].

No definite treatment is proffered for anomalies involving the shape of the spleen; these anomalies do not affect the functions of the spleen and often most times diagnosed incidentally [1-14]. The index case is however not an exception, the anomalies were diagnosed incidentally, thereby conforming to these literatures.

## CONCLUSION

Congenital anomalies of the spleen of the spleen especially those involving the shape are most times incidentally diagnosed from basic radiologic ultrasonographic examination of the abdomen, these lesions most often do not interfere with the normal splenic functions.

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