Case Report

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Anatomy Section

Accessory Spleen (Splenenculus) in the Greater Omentum: A Rare Case with Histological and Embryological Insights

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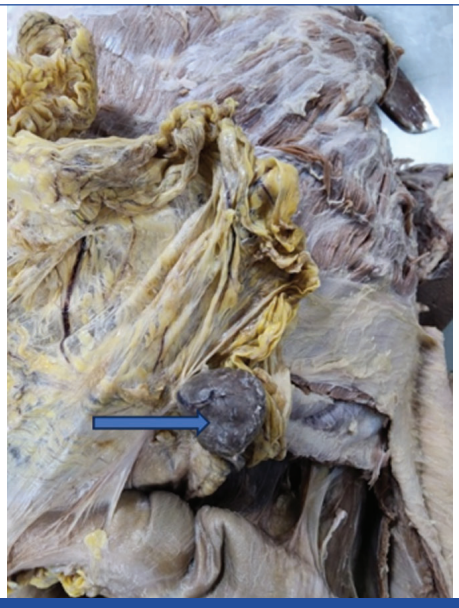
ABSTRACT

The spleen is a wedge-shaped secondary lymphatic organ, situated in the left hypochondrium, sandwiched between the stomach and the diaphragm, extending along the 9th to 11th ribs. An accessory spleen is an extrasplenic lymphoid tissue found separately from the primary spleen. The most common locations for an accessory spleen are at the hilum of the spleen and near the tail of the pancreas. It may also be found in the lienorenal ligament, gastrosplenic ligament, in the wall of the stomach, mesentery, rarely in the greater omentum, spermatic cord or gonads. During routine undergraduate cadaveric dissection, an accessory spleen was found to be attached to the posterior layer of the greater omentum. It was measured about 3.5 cm x 3 cm x 2 cm in dimensions. The sections of the tissue were stained with the Haematoxylin and Eosin (H & E) stain and the histological features were suggestive of splenic tissue. Surgeons should be aware of the presence of accessory spleens, as the recurrence of haematological disorders may occur after splenectomy. Although during splenectomy for non-haematological disorders or splenic rupture, preserving the accessory spleen is advisable as it performs all the functions of a normal spleen. During radiographic imaging, an accessory spleen can be mistakenly diagnosed as an enlarged lymph node or a tumour. Although, most of the cases are asymptomatic, complications such as abdominal pain or vomiting may occur due to torsion.

Keywords: Abdominal plain, Haematological disorders, Lymph node, Splenic rupture, Splenic tissue

CASE REPORT

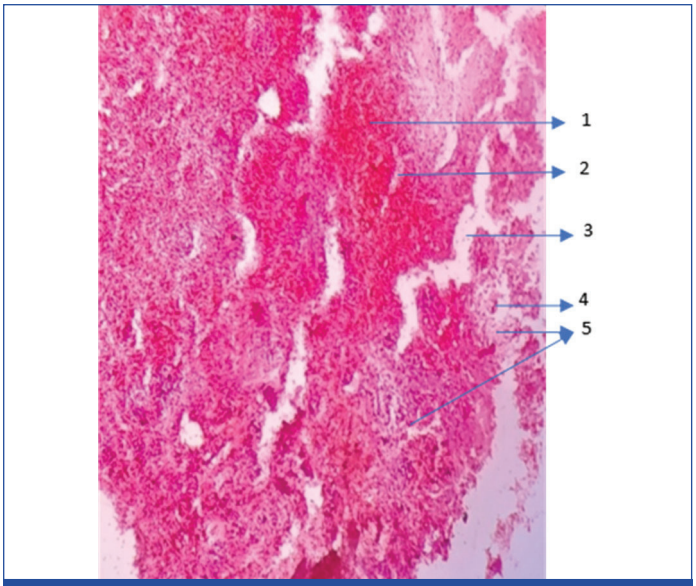
During a routine undergraduate cadaveric dissection, the anterior abdominal wall was cut, opened and the greater omentum was seen. An accessory spleen was found to be attached to the posterior layer of the greater omentum in a female cadaver [Table/Fig-1]. It measured 3.5 cm in length, 3.0 cm in breadth, 2.0 cm in thickness, ovoid in shape, firm in consistency and encapsulated. No signs of haemorrhage, infarction or necrosis could be found in it or in the greater omentum. The dimensions were slightly exceeded than those of the usual accessory spleen, which is typically around 1 to 3 cm [1]. No separate vascular pedicle was identified. The accessory spleen received its blood supply from neighboring vessels. The normal spleen was found in the left hypochondrium, with its usual size and shape [Table/Fig-2]. All other organs were found to be normal in position and in appearance.



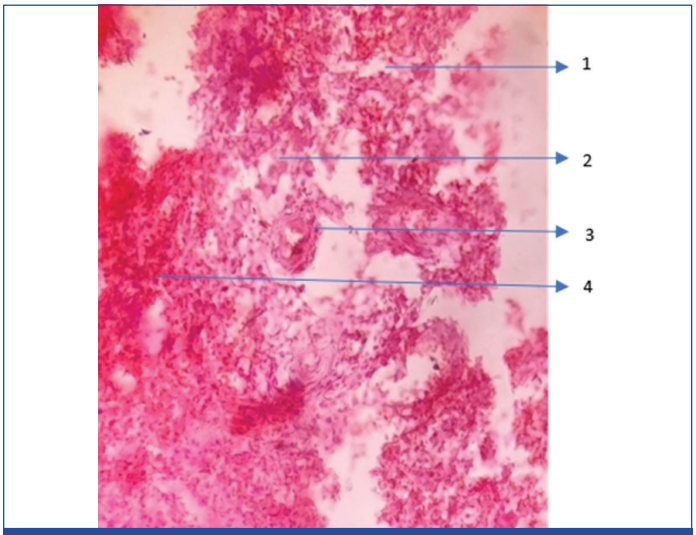
[Table/Fig-1]: Accessory spleen attached to the greater omentum (blue arrow).

[Table/Fig-2]: Primary spleen in the cadaver (blue arrow).

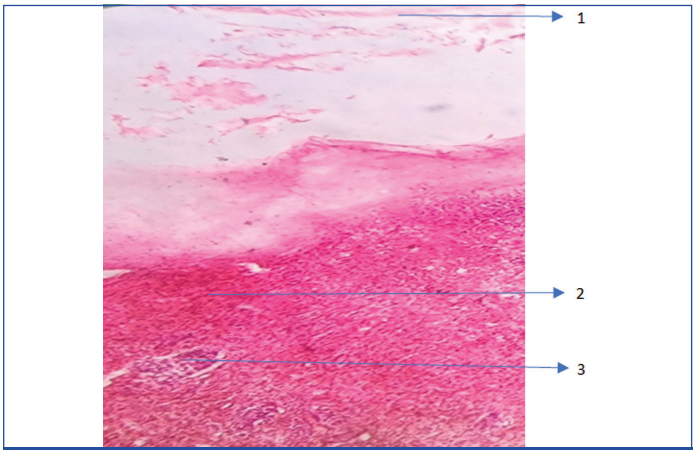
An accessory spleen then was kept in Bouin's fluid for 4-5 days. The paraffin blocks were prepared for cutting. With the help of a rotary microtome, 5-7-micron thick ribbons of the blocks were made. The sections were stained with the H&E stain. The slides were prepared and observed under low and high power of light microscope. Histological features, such as a capsule, incomplete trabeculae and lymphoid follicles containing an eccentric arteriole in the white pulp, were observed. White pulp was observed to be surrounded by red pulp with venous sinuses [Table/Fig-3-5]. No pathological changes like congestion, necrosis, fibrosis, calcification, lymphoid hyperplasia, etc., could be found.



[Table/Fig-3]: Photomicrograph of accessory spleen (Low power): 1-Red pulp 2-Venous sinuses in red pulp; 3-Connective tissue trabeculae; 4-Eccentric arteriole in white pulp; 5-White pulp.



[Table/Fig-4]: Photomicrograph of accessory spleen (High power): 1) Venous sinuses in red pulp; 2) White pulp; 3) Eccentric arteriole in white pulp; 4) Red pulp.



[Table/Fig-5]: Photomicrograph of histology of accessory spleen (Low power) 1-Capsule, 2-Red pulp, 3-White pulp

DISCUSSION

The spleen arises at approximately six weeks of intrauterine life as proliferating mesenchyme within the cranial end of the dorsal mesogastrium [2]. Small splenic tissue masses are derived from the mesenchymal cells in the dorsal mesogastrium. These masses may be deposited elsewhere during their migration from the midline to their definitive position in the left hypochondrium, resulting in an accessory spleen due to imperfect fusion of these masses with the main spleen [2]. Approximately, 70% of normal spleens exhibit a notched superior border, indicating the persistence of fetal lobulation formed by the fusion of these small lobular masses [3]. Various developmental anomalies such as multiple spleens or polysplenia, complete agenesis or asplenia, persistent lobulation and isolated small additional splenunculi are related to the spleen [2].

Accessory spleens may be single or multiple and are mostly situated at the splenic hilum. These can be partly or completely embedded in the tail of the pancreas. They may also be found in the lienorenal ligament, gastrosplenic ligament, in the wall of the stomach, mesentery, or rarely, in the greater omentum, spermatic cord, or gonads [2,4]. Sometimes, one or more accessory spleens may be found along the path from the abdomen to the pelvis due to splenogonadal fusion [5]. Accessory spleen in the greater omentum is considered as a rare congenital anomaly. It is incidentally reported during autopsies at a rate of 0.6% to 4% [6]. Dogan U et al., investigated accessory spleens in 720 consecutive autopsy cases. They found fifty-four accessory spleens in 48 (6.7%) cases [7]. Among them, 28 (51.9%) were seen near the hilum of the main spleen, 13 (24.1%) in the greater omentum, five (9.3%) within the tail of the pancreas, three (5.5 %) in the gastrosplenic ligament, three (5.5%) in the splenorenal ligament and two (3.7%) in the pelvis. The accessory spleen, also known as a splenenculus, is typically around 2 cm in diameter. Most of the cases are asymptomatic, but a few cases may present with abdominal mass leading to abdominal pain and vomiting, which may occur due to torsion, ischaemia, spontaneous rupture, haemorrhage and cyst formation [8,9]. Torsion and ischaemia can cause gangrene, abscess formation, peritonitis and can show signs and symptoms of an acute abdomen, as seen in torsion of the main spleen [8-10].

Accessory spleens are often incidentally detected during abdominal ultrasound or CT imaging [8].

Splenosis or acquired accessory spleen occurs following trauma or surgical procedures like splenectomy. In this condition, splenic tissue is deposited on vascularized surfaces within the abdominal cavity, receiving blood supply from these sites [11].

Histologically, splenenculus and splenosis can be differentiated. In this case of splenenculus, features such as a capsule, trabeculae, lymphoid follicles containing an eccentric arteriole in the white pulp and surrounding red pulp are seen. In splenosis, the tissue is covered by a capsule, but the lymphoid follicle with an eccentric arteriole may not be visible [12].

To avoid misdiagnosing the splenenculi as a pancreatic or renal tumour, their presence can be confirmed by a CT scan or a 99m Tc-heat denatured red blood cell scan, along with a biopsy [13]. Various studies have reported frequencies of one, two, or three accessory spleens as 79-86%, 10.5-14% and 1-10.5%, respectively [8,11,14]. Mortelé KJ et al., reported one accessory spleen in 15.6% of patients and two or three accessory spleens in 13% of patients among 1,000 consecutive patients undergoing abdominal contrast-enhanced CT scans [14].

Accurate preoperative radiological investigations are essential to prevent the recurrence of haematological disorders after splenectomy. Although preserving the accessory spleen during splenectomy for non-haematological disorders or splenic rupture is advisable, as it performs all the functions of a normal spleen [15].

CONCLUSION(S)

Radiologists and surgeons should be aware of the presence of an accessory spleen, as it may be misdiagnosed as an enlarged lymph node, pancreatic, or renal tumour on imaging or during surgery. Accurate pre-operative diagnosis is crucial to avoid disease recurrence. Although most cases are asymptomatic, complications such as peritonitis, abscess formation and gangrene can occur due to torsion.

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