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Splenunculi-frequency and characteristics in patients at a tertiary care hospital of Wayanad district

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Abstract

Background: Splenunculi, in other words a supernumerary spleen or accessory spleen is a small well defined mass of splenic tissue found separate from the main spleen. It is a congenital entity. The splenunculi generally are the result of failure of fusion of the primordial splenic buds in the dorsal mesogastrium during the 5th week of fetal life. Splenunculi are generally asymptomatic. Rarely they can be a cause of left upper abdominal pain. The study was to evaluate the frequency and characteristics of splenunculi in patients undergoing Computerised tomography of the abdomen in our hospital.

Methods: An observational study was carried out in a hospital in Wayanad District between May 2019 to October 2019 (6 months). 256 consecutive patients were included in the study who belonged to the age groups between 11 and 90 years. Patients with a history of abdominal trauma, previous abdominal surgery, abdominal malignancies and haematological disorders were excluded from the study. Each study was systematically analysed for the presence or absence of splenunculi. If present, the number, location, size and shape were assessed and tabulated.

Results: A total of 273 abdominal CT scans done from May 2019 to October 2019 were analyzed. 256 cases were included in the study. The most common age group was between 50-70 years. Among the 256 subjects, 70 had splenunculi (27%). Majority of the splenunculi were solitary (76%). One subject had four and another had five splenunculi. Most of the splenunculi were less than 5mm and were oval in shape. The commonest location was at the splenic hilum and lower pole of the spleen (36% each).

Conclusion: The frequency of splenunculi was more compared to other studies. The most common location was at the splenic hilum and lower pole. Majority of the splenunculi were solitary and less than 5mm in size.

Keywords: Splenunculi, CT, Wayanad

Introduction

Splenunculi, in other words a supernumerary spleen or accessory spleen is a small well defined mass of splenic tissue found separate from the main spleen. It is a congenital entity. The splenunculi generally are the result of failure of fusion of the primordial splenic buds in the dorsal mesogastrium during the 5th week of fetal life^[1].

The incidence of accessory spleen is about 10- 30% in the general population undergoing autopsy and about 10-16% in those undergoing ultrasound and contrast enhanced computed tomography^[2]. The size of the accessory spleen generally ranges from a few millimetres to a few centimetres, however most of the accessory spleen measure less than 2cms. The splenic hilum is the most common location for the accessory spleen, however they could be found anywhere within the peritoneal cavity along the gastrosplenic ligaments, splenorenal ligament, along the wall of the stomach, within the mesentery and rarely even in the pelvis and scrotum. Splenosis is an acquired condition which occurs generally secondary to trauma. An Accessory spleen is asymptomatic and is generally detected incidentally on ultrasound or Computed tomography, MRI or by 99m Tc heat-denatured red blood cell scan. Histopathology is the gold standard for confirmation^[3].

Tc-99 scintigraphy can also be used to confirm the presence of accessory spleen and differentiate them from lymph nodes.

There are no studies done on splenunculi in this part of the country and hence in this background this study was undertaken to evaluate the frequency and describe the characteristics like size, shape and location of the splenunculi in patients undergoing Computerised tomography of the abdomen in our hospital.

Materials and Methods

An observational study was undertaken between May 2019 to October 2019 at a tertiary care hospital in Wayanad district. All patients undergoing CT abdomen were evaluated for the presence of splenunculi. A total of 273 subjects were analysed.

Inclusion criteria

Male and female patients more than 10 years of age who were referred for imaging of the abdomen with computed tomography.

Exclusion criteria

- Trauma patients.
- Patients with hemolytic anaemia eg: sickle cell anaemia.
- Patients who have undergone abdominal surgery in the past.
- Patients with abdominal malignancies.

After applying therefore mentioned criteria, a total of 256 subjects were included in the final study. Institutional ethical clearance was obtained from the ethical committee at DM WIMS hospital Wayanad.

The location of the splenunculi was assessed in relation to the main spleen and categorised into four categories namely, splenic hilum, upper pole, lower pole and mid pole.

CT techniques and specifications

All studies were performed using a multidetector 16 slice Somatom Emotion Siemens CT scanner (Erlangen, Germany). The studies were interpreted on plain and contrast images. Non-ionic intravenous contrast, Iodixanol (Visipaque, GE healthcare) 320 mg/ml was administered at a maximum dosage of 2ml/kg.

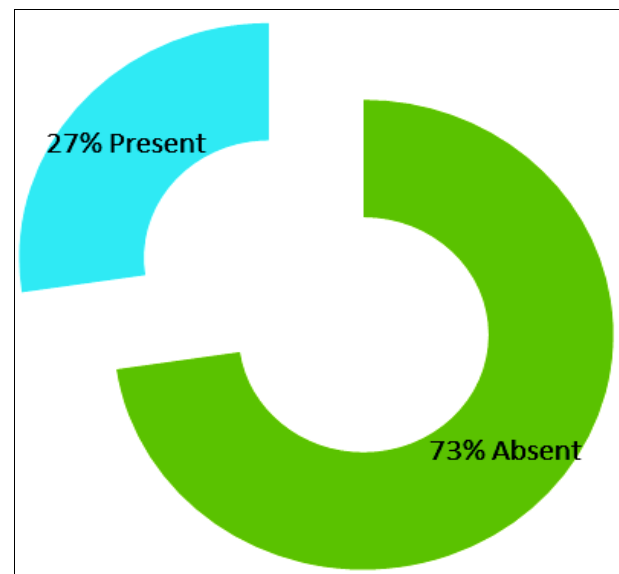
Each CT study was performed using a high resolution helical protocol (16 x 0.6 mm collimation, 5 mm section thickness, 0.7 mm reconstruction interval, 120 mAs, 130 kVp and 1-1.3 mm per rotation table speed). Multiplanar

reconstructions were performed using a standard algorithm at 0.75 mm reconstruction interval for the better localisation and characterisation of splenunculi.

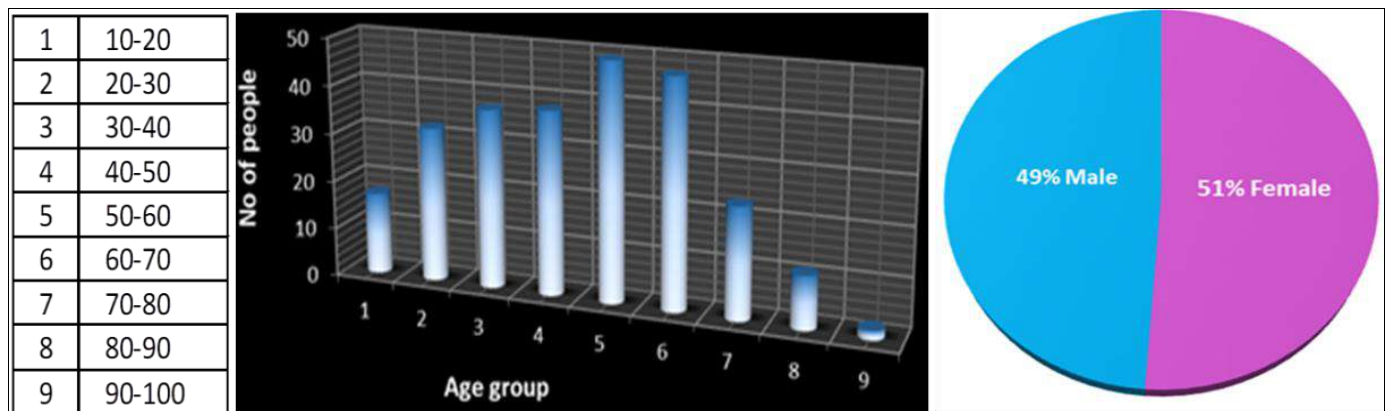
Descriptive statistics like mean and percentage were used in the analysis.

Results

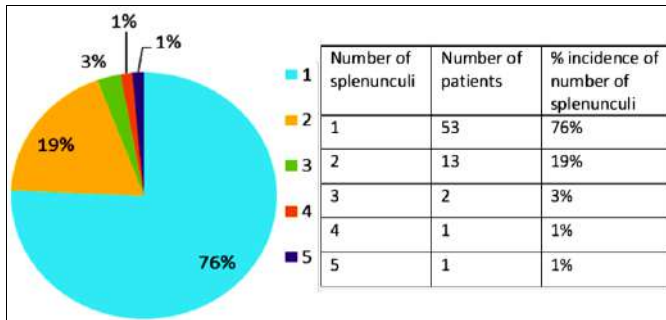
256 patients (131(%) women and 125 men) were included in the study. The ages of the subjects ranged from 10 years to 91 years (with a mean age of 48.8 years. Among the subjects included in the study, 70(27%) had splenunculi. (Graph 2). The highest frequency was seen in the age group of 50-70 years (Graph 1). Most of the splenunculi were solitary and small (1-5 mm) (Graph 3). The incidence of > 1 cm sized splenunculi in our study population was 11% (Graph 3, 4). Majority of the splenunculi were oval in shape and located at the splenic hilum and lower pole (36% each) (Graph 5).



Graph 1: % Incidence of Splenunculus



Graph 2: Age wise distribution of study population



Graph 3: % Incidence of No. of splenunculi



Graph 4: Size range



Graph 5: % Incidence by site

Discussion

Splenunculi, in other words an accessory spleen, supernumerary spleen or splenules is a congenital entity seen separately from the main body of the spleen [4]. They occur due to failure of fusion of the primordial splenic buds in the dorsal mesogastrium during the fifth week of fetal development. The most common location of splenunculi is the splenic hilum and at the tail of pancreas [5]. Splenunculi can also be seen along the wall of the stomach, gastrosplenic or splenorenal ligaments and even in the pelvis or scrotum. Majority of the splenunculi are subcentimetric in size. The number of splenunculi varies from one to six.

Splenunculi are generally asymptomatic and detected incidentally on ultrasound, CT and MRI of the abdomen. They represent one of the relatively common anatomic variations with an incidence of 10-30% in the general population [4]. Splenunculi needs to be differentiated from Splenosis which occurs due to autotransplantation of splenic tissue, usually after surgery or trauma. In patients with abdominal malignancies, metastatic lymph nodes may mimic a Splenunculus.

Imaging plays an important role in detecting splenunculi. On CT splenunculi appear as well-defined oval, spherical structures similar in density to the spleen. On contrast studies they enhance in a similar pattern to that of the splenic parenchyma. A feeding artery from the splenic

artery can often be demonstrated. Iron containing contrast agents are also helpful for diagnosis. On MRI the splenunculi appear isointense to the spleen on all sequences. A Splenunculus may be of clinical significance in patients with splenic trauma who need to undergo splenectomy for preservation of splenic tissue. In patients with haematological disorders (haemolytic anemias, idiopathic thrombocytopenic purpura or hypersplenism) the splenunculi may have to be excised along with the main spleen to prevent recurrence of symptoms. In such patients a Tc-99m sulphur colloid scintigraphy study may help in identifying the splenunculi non-invasively and help in preoperative planning. Rarely splenunculi may be the cause of acute left upper abdominal pain due to hemorrhage, torsion or spontaneous rupture [6] Haemorrhage and spontaneous rupture generally occur due to haematological disorders or infections such as malaria or infectious mononucleosis. A less common cause of haemorrhage is torsion of the Splenunculus. Torsion generally occurs in splenunculi with a long vascular pedicle. A contrast enhanced CT scan is often diagnostic and can demonstrate the twisted vascular pedicle in addition to the infarcted Splenunculus or haemorrhage secondary to venous congestion. Inflammatory changes are often seen in the surrounding mesentery. The diagnosis of a torted Splenunculus is important as a misdiagnosis can lead to rupture and hemorrhagic shock. Other complications such as peritonitis and intestinal obstruction can also occur following rupture. Most splenunculi with torsion are generally > 3cm. Torsion of a Splenunculus is rare in small splenunculi < 2 cm. Some patients may have chronic intermittent torsion and present with recurrent left upper abdominal pain.

During embryogenesis a Splenunculus may fuse with the pancreatic tail and vice versa with a resulting spleno-pancreatic fusion anomaly. This may be misinterpreted as a pancreatic tail mass. The knowledge of this anomaly may help in avoiding possible complications during a distal pancreatectomy or splenectomy. For the afore-mentioned reasons, it is important to familiarise with the prevalence and imaging appearance of splenunculi.

Our study showed that splenunculi had a prevalence of 27% in patients undergoing abdominal CT. A similar study by Rashid *et al.* [4] Mortele *et al.* [2] and Romer *et al.* [7] revealed 18.8%, 16% and 11.5% prevalence respectively. The lower prevalence in these studies could be attributed to use of lower resolution CT techniques and also different ethnicities of the study population.

Rashid *et al.*, Mortele *et al.* and Romer *et al.* showed a maximum of 3 splenunculi per patient with maximum diameters of 79 mm, 24 mm and 32 mm respectively. In their studies most of the splenunculi were round, oval or triangular in shape. Our study showed a maximum of 5 splenunculi in one patient, a maximum diameter of 12.7 mm and a sickle shaped Splenunculus in one patient in addition to the above-mentioned shapes. This patient had five splenunculi with maximum diameter of 5 mm. The mean size of splenunculi in our study was 6.2mm. These findings are comparable to the results of Rashid *et al.* (mean size 14.7 mm), Mortele *et al.* (mean size 16.8 mm) and Romer *et al.* (mean size 10.3 mm).

In our study the most common location of the splenunculi was the splenic hilum and lower pole (36% each), followed by lateral 15%. Rashid *et al.* reported a medial location in

75.6% followed by anterior (7.3%) and lateral (6%). In our study no intra-pancreatic or pelvic splenunculi were detected in comparison to Mortelet *et al.* who reported two intra-pancreatic splenunculi in a sample of 1000 patients. Rashid *et al.* and Romer *et al.* reported no intra-pancreatic splenunculi in a sample size of 334 and 1735 cases respectively.

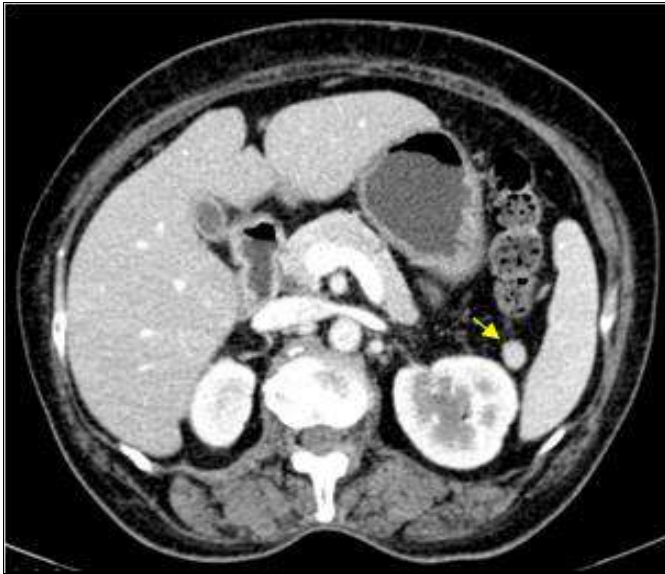


Fig 1: Axial; contrast enhanced CT in a middle aged lady showing an enhancing oval splenunculus (yellow arrow) at the splenic hilum just anterior to the left kidney.

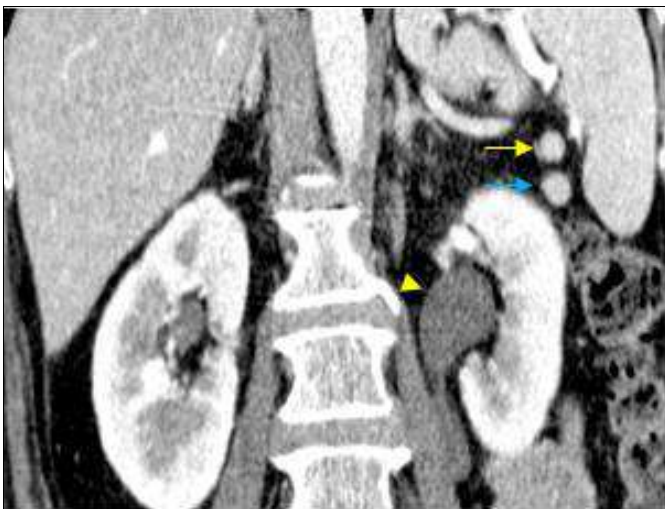


Fig 2: Coronal contrast enhanced CT in a middle aged man showing two enhancing oval splenunculi one each at the splenic hilum (yellow arrow) and lower pole (blue arrow) of the spleen. A dilated left extra renal pelvis (yellow arrow head) is also incidentally noted.

Conclusion

In conclusion, splenunculi are common findings found on abdominal imaging and CT is highly accurate in detecting splenunculi. In our study the frequency of splenunculi was more compared to other studies. The most common location was at the splenic hilum and lower pole. Majority of the splenunculi were solitary and less than 5mm in size. In patients presenting with left upper abdominal pain, CT may play a role in diagnosing pathologies related to the splenunculi and unnecessary surgery can be avoided in such cases.

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Conflict of interest: Nil

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