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RESEARCH ARTICLE

SPLENUNCULI-INCIDENCE, LOCATION AND CHARACTERISTICS IN PATIENTS UNDERGOING CT IN KASHMIR DIVISION OF JAMMU AND KASHMIR

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ABSTRACT

Splenunculus or splenunculi are congenital small asymptomatic benign nodules on spleen, present as splenic tissue mass but separate from the main spleen. They are formed as a result of failure of fusion of the primordial splenic buds in the dorsal mesogastrium during the 5th week of foetal life. Splenunculi are generally asymptomatic. Rarely they can be a cause of left upper abdominal pain. The study was to evaluate the incidence and characteristics of splenunculi in patients undergoing Computerised tomography of the abdomen in Kashmir division of Jammu and Kashmir. **Methods:** The study was carried in the Department of Radio-diagnosis and Imaging, GMC Srinagar of Kashmir. 178 patients in the age group 18-70 years (with a mean age of 47.6years) were included in the study. The patients with history of previous abdominal surgery, abdominal trauma, abdominal malignancies and haematological disorders were excluded from the study. The patients that were included in the study were keenly analysed for splenunculi and if present, the number, location, size and shape were noted and analysed. **Results:** A total of 178 patients with abdominal CT scans were analysed from June 2021 to June 2022. The most common age group was between 41-60 years. Among the 178 subjects, 58 had splenunculi (33%). Majority were solitary and small (0.5-1cm) (53%). Most of the splenunculi were located at splenic hilum (50%) and were 0.5-1cm in size and oval in shape. **Conclusion:** The incidence of splenunculi in Kashmiri population was high in the age group between 41-60 years compared to other age groups. Majority of splenunculi were solitary and the most common location being splenic hilum and size of 0.5-1cm with oval shape.

INTRODUCTION

Splenunculus, splenunculi (Pleural) also known as supernumerary spleens, accessory spleens, or splenules, are congenital small asymptomatic benign nodules of spleen, present as splenic tissue mass but separate from main spleen. It occurs as a result of failure of fusion of the primordial splenic buds in the dorsal mesogastrium during the 5th week of fetal life. They should not be confused with splenosis which is acquired and intraperitoneal. Accessory spleens are a relatively common with incidence of around 10% to 30% in general population undergoing autopsy and about 10-16% in those undergoing ultrasound and contrast enhanced computed tomography (1). An individual can have one to six accessory splenic buds whose size can vary greatly but usually are around 1 cm, however most of the accessory spleen measure less than 2 cms (2). An accessory spleen is commonly located near splenic hilum but can be located anywhere in peritoneal cavity and rarely in pelvis and scrotum. Accessory spleens can become a radiologist headache during imaging. On imaging particularly CT scans, accessory spleens can appear similar to lymph nodes or a metastatic deposit. Diagnosis may sometime require nuclear medicine.

^{99m}Tc-nanocolloid scan can help to differentiate between accessory glands, neoplastic growth, splenosis and lymph nodes (3). Histopathology is considered to be the gold standard diagnostic technique (4). There are no studies done on splenunculi in Kashmir region hence in this background this study was undertaken to evaluate the incidence and describe the characteristics like size, shape and location of the splenunculi in patients undergoing Computerised tomography of the abdomen in GMC, Srinagar.

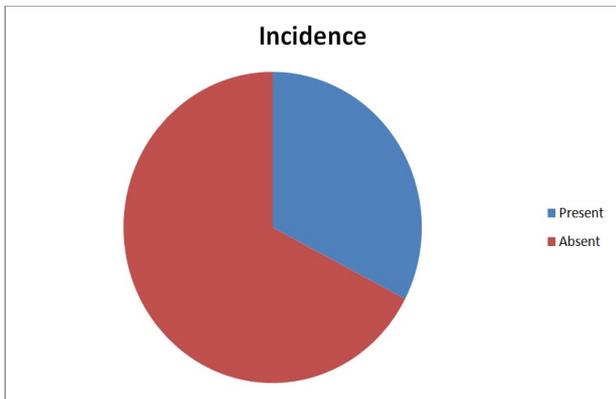
MATERIALS AND METHODS

The study was carried in the Department of Radio-diagnosis and Imaging, GMC Srinagar of Kashmir from June 2021- June 2022. 178 patients in the age group 18-70 years (with a mean age of 47.6years) were included in the study. The patients with history of previous abdominal surgery, abdominal trauma, abdominal malignancies and haematological disorders were excluded from the study. The patients that were included in the study were keenly analysed for splenunculi and if present, the number, location, size and shape were noted and analysed.

CT techniques and specifications: All studies were performed using a multidetector 256 slice Somatom Emotion Siemens CT scanner. The studies were interpreted on plain and contrast images. Non-ionic intravenous contrast, Iohexol (Omnipaque, GE healthcare) 350 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

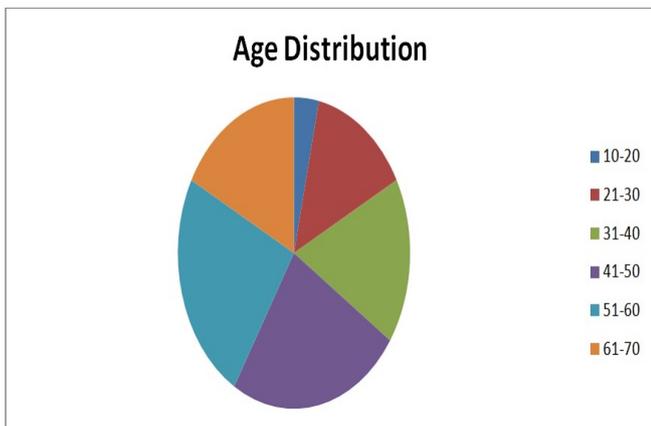
The observational study from June 2021 to June 2022 included 178 patients (86 women and 92 men). The ages of the subjects ranged from 18-70 years (with a mean age of 47.6years) (Table 1). Among the subjects included in the study, 58(33%) had splenunculi.(Graph 1). The highest frequency was seen in the age group of 41-60 years (Graph 2). Most of the splenunculi were solitary and small (0.5-1cm) (Graph 3). The incidence of > 2.5cm sized splenunculi in our study population was 7% (Graph 3, 4). Majority of the splenunculi were oval in shape and located at the splenic hilum (50%) (Table 4).



Graph 1

Table 1

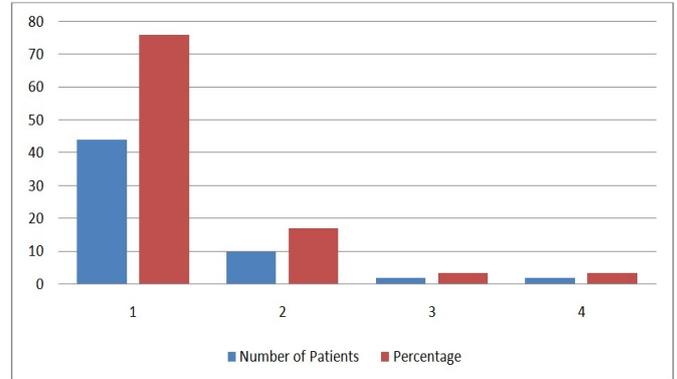
S.No	Age Group	No. of people with spleenunculi
1	10-20	2
2	21-30	8
3	31-40	10
4	41-50	14
5	51-60	14
6	61-70	10



Graph 2

Table 2

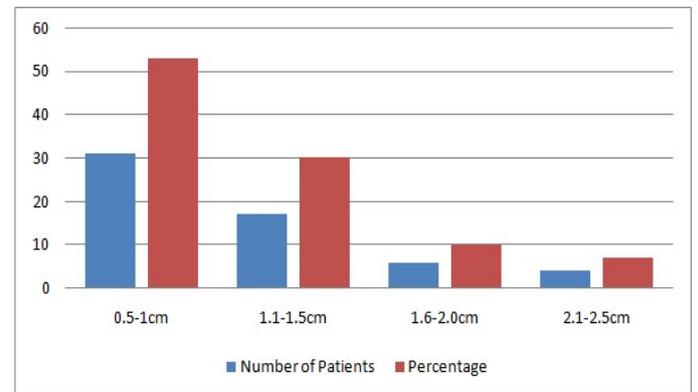
Number of Splenunculi	Number of patients	% Incidence with reference to number of Splenunculi
1	44	76
2	10	17
3	2	3.5
4	2	3.5



Graph 3

Table 3

S.No	Max. size range	Number of patients	Percentage
1	0.5-1cm	31	53%
2	1.1-1.5cm	17	30%
3	1.6-2.0cm	6	10%
4	2.1-2.5cm	4	7%



Graph 4

Table 4

S.No	Location of Splenunculi	Number of Splenunculi	Percentage
1	SPLENIC HILUM	39	50
2	PANCREATIC TAIL	5	6.5
5	Gastrosplenic region	6	7.5
6	Upper pole	3	3.5
7	Lower pole	9	12
8	Anterior pole	16	20.5

DISCUSSION

The spleen is included and visible in all abdominal and chest CT images (5). An accessory spleen, also known as a supernumerary spleen, splenunculi, or splenule, is a healthy splenic tissue found away from the main body of the spleen (6).

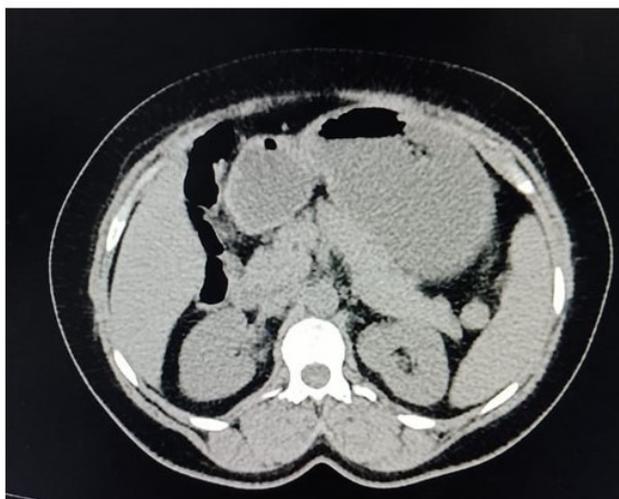


Figure 1. Showing Splenunculus at anterior Hilum

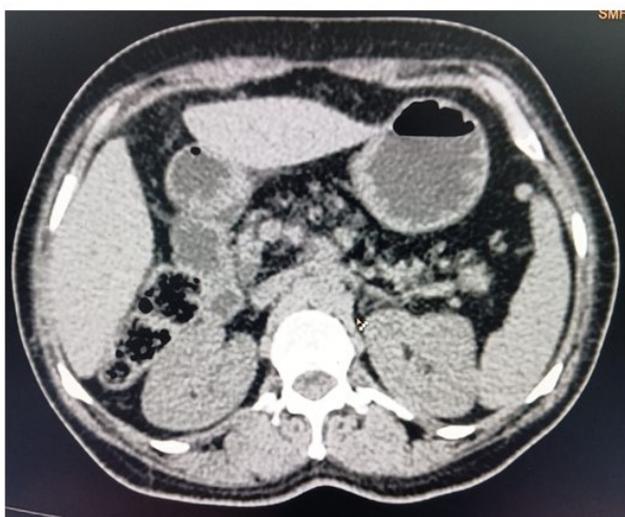


Figure 2. Showing Splenunculus at anterior pole

Because a CT scan is the most often used imaging modality to evaluate the abdomen and pelvis, familiarity with the CT features of an accessory spleen is necessary to avoid mistakes in the interpretation of abdominal imaging (6,8). Although an accessory spleen is frequently asymptomatic and discovered by chance (6), its clinical relevance can be divided into three categories. First, after splenectomy, the accessory spleen can enlarge, which is responsible for the recurrence of hematological illnesses treated with a splenectomy (idiopathic thrombocytopenia, hereditary spherocytosis, acquired autoimmune hemolytic anemia, and hypersplenism) (7). Thus, during a splenectomy for blood dyscrasia, all accessory spleens should be eliminated, and a surgeon's awareness of their presence is critical when the objective is to remove all functional splenic tissue (6,8). Second, an accessory spleen may be misinterpreted with an enlarged lymph node or neoplastic growth in the tail of the pancreas, gastrointestinal system, kidney, adrenal gland, or gonads during medical imaging (9). Third, an accessory spleen might create an acute abdomen coupled with an intraperitoneal inflammatory mass if it becomes symptomatic due to torsion, spontaneous rupture, bleeding, or cyst formation (6,10,11). For the reasons stated above, familiarity with the prevalence and an accessory spleen's CT appearance is significant, and to the best of our knowledge, only limited data are available researching these aspects. As a result, we endeavoured to investigate these parameters and document the occurrence, location, form, and size of the accessory spleen in the Kashmiri population. Our findings suggest that accessory spleens are present in 33% of patients receiving abdominal CT scanning, although Mortelet *et al.* (2) and Romer *et al.* (12) found 16% and 11.5% CT prevalence, respectively, which is slightly lower than our findings.

This could be due to the use of a high resolution CT method or a distinct population group. Mortelet *et al.* (2) and Romer *et al.* (12) discovered up to three accessory spleens per patient with maximal sizes in the range of 24 mm and 32 mm, respectively. The form of the accessory spleens varied from round to oval to triangular in their research. In our investigation, two patients had four accessory spleens and the largest measuring 2.1-2.5 cm in its widest diameter. The splenic hilum was found to be the most common location of the accessory spleen relative to the main spleen, with a record of 50%, followed by the anterior pole (20.5%), lower pole (12%), Pancreatic tail and Gastro splenic (6.5 and 7.5% respectively), and Upper pole locations (3.5%). Mortelet *et al.* (2) observed no accessory spleens above to the main spleen, and Romer *et al.* (12) did not investigate this area, which again may be explained by the fact that this could be owing to the additional effect of multiplanar reformatting, or it could be related to the diverse demographic groupings in each study. The current investigation found six intrapancreatic accessory spleens, which is comparable to the work of Halpert *et al.* (14). In a sample of 1735 patients, Romer *et al.* (12) found no intrapancreatic accessory spleens. Although one out of every six accessory spleens is found in the pancreatic tail (13), our analysis corroborated this. However, radiologists should be mindful that a modest pancreatic tail lesion could represent an intrapancreatic accessory spleen, and a high index of suspicion will lead to correlative imaging and a mix of CT, MRI, and nuclear medicine studies that help to confirm the diagnosis and save you money on unneeded surgery (13).

CONCLUSION

An accessory spleen is a common discovery, and a CT scan is an accurate means of identifying it on which the surgeon can rely while searching for any functioning splenic tissue prior to splenectomy. When a mass of practically similar density to the spleen is detected in the left side of the upper abdomen, regardless of shape or size, number or position, being aware of such a common entity is helpful. Further workup with proper radionuclide imaging can save the patient from surgical exploration or needling.

Ethical Issues: No ethical issue in performing this study as CT is routinely done in Radiology Department

Conflict of interest: Nil

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