ORIGINAL RESEARCH

Surgical treatment of benign splenic lesions in children- A clinico- pathological study

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ABSTRACT

Background: Located high in the left hypochondrium, the spleen is a mesodermal intraperitoneal lymphoid organ. The present study was conducted to evaluate surgical treatment of benign splenic lesions in children. **Materials & Methods:** 56 children with benign splenic lesions of both genders were included. Clinical history, laboratory results, imaging results, surgical procedures, pathological diagnoses, and prognoses were recorded. Imaging results were reviewed to determine the location of the lesion inside the spleen. All cases were managed surgically. **Results:** Out of 56 cases, 32 were males and 24 were females. Clinical findings were abdominal pain in 26, abdominal mass in 27, skin petechia in 8 and hemolytic anemia with jaundice in 5 patients. Lesion features were focal cystic lesion in upper pole in 13, focal cystic lesion in hilum in 9, focal solid upper pole in 14, focal solid upper hilum in 8 and diffused cystic+ solid upper+ hilum+ lower pole in 12 cases. Pathological diagnoses were vascular malformations in 10, congenital epithelial cyst (CEC) in 29, hamartoma in 3, leiomyoma in 6, lymphangioma in 2, CEC+ hemangioma in 1 and sclerosing angiomatoid nodular transformation (SANT) in 5 cases. Surgery performed was total splenectomy in 30 and partial splenectomy in 26 cases. The difference was significant ($P< 0.05$). **Conclusion:** A summary of the different clinical features of benign splenic lesions in children is provided. Vascular malformation and congenital epithelial cysts are the most frequent pathological diagnosis. Both partial and whole splenectomy have good prognoses and low rates of recurrence; if at all possible, the former is recommended to maintain splenic function.

Keywords: hypochondrium, congenital epithelial cyst, Spleen

INTRODUCTION

Located high in the left hypochondrium, the spleen is a mesodermal intraperitoneal lymphoid organ. Numerous disorders might impact it, some of which are easily detected with standard imaging.[1] Even with contemporary imaging, it can be challenging to diagnose some focal splenic lesions; in some cases, a histologic tissue evaluation performed by percutaneous biopsy or even surgery is necessary to reach a definitive diagnosis. To guide the radiographic diagnosis, an understanding of splenic anatomy may be required.[2] According to microscopic histology, the splenic parenchyma is separated into two zones: the outer red pulp, which is composed of convoluted venous sinuses that trap red blood cells, and the central white pulp, which contains lymphocytes. Therefore, it is generally acknowledged that vascular splenic tumors typically develop in the red pulp and thus in the periphery, while lymphoid tumors typically develop in the white pulp and so in the middle of the spleen.[3]

Benign splenic lesions in children are uncommon but can be encountered in clinical practice. These lesions may be asymptomatic or present with mild symptoms, and are often discovered incidentally during imaging studies performed for other reasons.[4]Splenic lesions are uncommon, particularly in young patients. There may be solid or cystic lesions with a broad range of histologies.[5] There have been reports of various therapeutic approaches, such as spleen-preserving or non-preserving techniques. Open or laparoscopic/robotic surgical procedures are typically required for diagnostic and therapeutic purposes. There are currently very few reports of juvenile cases, and most published publications focus on adult cases with small patient numbers.[6]The present study was

conducted to evaluate surgical treatment of benign splenic lesions in children.

MATERIALS & METHODS

The study was carried out on 56 children with benign splenic lesions of both genders. Parents gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Clinical history, laboratory results, imaging results, surgical procedures, pathological diagnoses, and prognoses were recorded. Imaging results were reviewed to determine the location of the lesion inside the spleen. All cases were managed surgically. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total-56		
Gender	**Male**	**Female**
Number	32	24

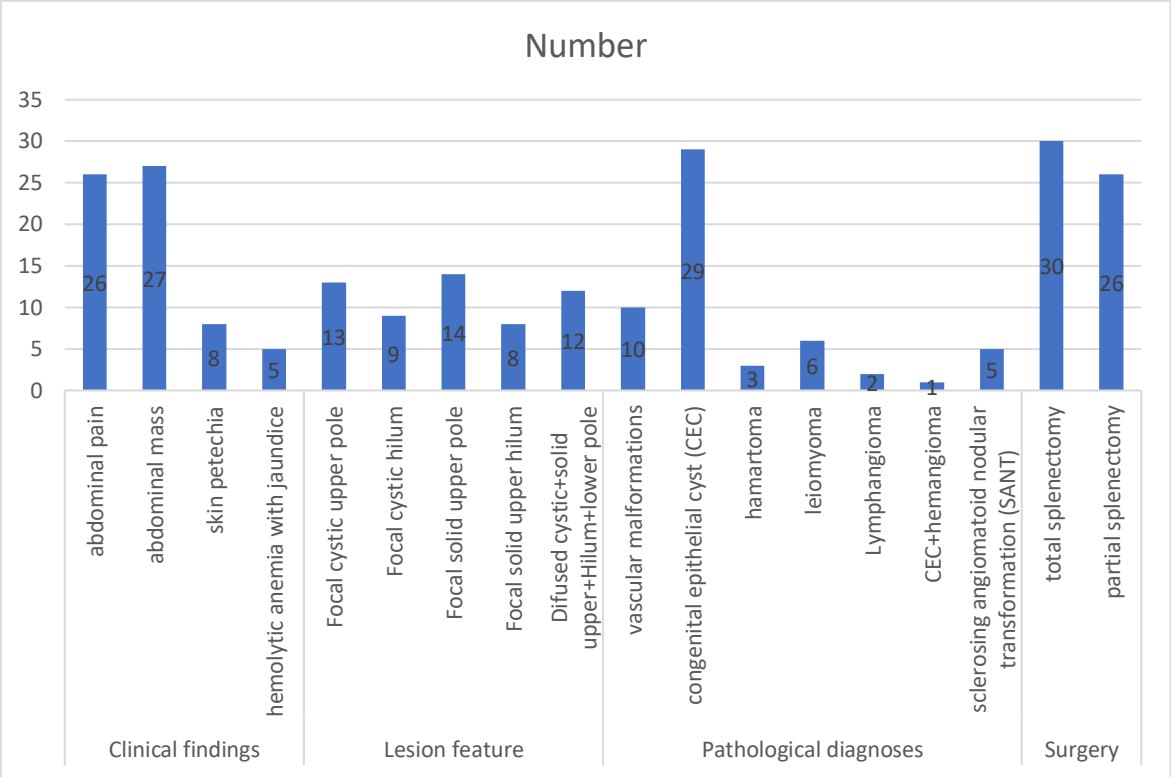
Table I shows that out of 56 cases, 32 were males and 24 were females.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Clinical findings	abdominal pain	26	0.90
	abdominal mass	27	
	skin petechia	8	
	hemolytic anemia with jaundice	5	
Lesion feature	Focal cystic upper pole	13	0.63
	Focal cystic hilum	9	
	Focal solid upper pole	14	
	Focal solid upper hilum	8	
	Difusedcystic+solidupper+Hilum+lower pole	12	
Pathological diagnoses	vascular malformations	10	0.05
	congenital epithelial cyst (CEC)	29	
	hamartoma	3	
	leiomyoma	6	
	Lymphangioma	2	
	CEC+hemangioma	1	
	sclerosing angiomatoid nodular transformation (SANT)	5	
Surgery	total splenectomy	30	0.94
	partial splenectomy	26	

Table II, graph I shows that clinical findings were abdominal pain in 26, abdominal mass in 27, skin petechia in 8 and hemolytic anemia with jaundice in 5 patients. Lesion features were focal cystic lesion in upper pole in 13, focal cystic lesion in hilum in 9, focal solid upper pole in 14, focal solid upper hilum in 8 and diffused cystic+solid upper+ hilum+lower pole in 12 cases. Pathological diagnoses were vascular malformations in 10, congenital epithelial cyst (CEC) in 29, hamartoma in 3, leiomyoma in 6, lymphangioma in 2, CEC+hemangioma in 1 and sclerosing angiomatoid nodular transformation (SANT) in 5 cases. Surgery performed was total splenectomy in 30 and partial splenectomy in 26 cases. The difference was significant (P< 0.05).

Graph I Assessment of parameters



DISCUSSION

Splenic hemangioma is benign vascular tumor of the spleen, often present at birth. It is typically asymptomatic, but large hemangiomas may cause abdominal pain or fullness. It is often found incidentally on ultrasound or CT scan.[7]It is characterized by a well-defined, hyperechoic mass on ultrasound or an enhancing lesion on CT/MRI.Most cases are asymptomatic and require no treatment.[8,9] In some cases, observation or surgical removal may be considered if the lesion is large or symptomatic.Splenic cysts are fluid-filled sacs that can be congenital (primary) or acquired (secondary). They are generally asymptomatic but may present with left upper quadrant pain if large.[10] They can be identified on ultrasound as an anechoic (fluid-filled) lesion. CT and MRI can provide further details on the size and characteristics of the cyst.Many small cysts do not require treatment. Larger cysts or those causing symptoms may require surgical intervention or aspiration.[11,12]The present study was conducted to evaluate surgical treatment of benign splenic lesions in children.

We found that out of 56 cases, 32 were males and 24 were females.Maccoll et al[13]reported 2 cases of laparoscopic management of large, symptomatic splenic cysts.Two patients presented with symptomatic splenic cysts. The first was a simple cyst by history, the second a posttraumatic cyst. Both patients were treated by laparoscopic cyst marsupialization followed by lining the cavity with Surgicel (Ethicon, Somerville, NJ) and performance of an omentopexy. Both procedures were performed without complication. At 25 months, neither patient showed any evidence of symptomatic or radiologic recurrence. Pathology confirmed the preoperative diagnoses.Laparoscopic marsupialization of splenic cysts in combination with lining the cyst cavity with Surgicel and omentopexy is a safe, feasible, and efficacious method of management with excellent results at 25-month follow-up.

We found that clinical findings were abdominal pain in 26, abdominal mass in 27, skin petechia in 8 and hemolytic anemia with jaundice in 5 patients. Lesion features were focal cystic lesion in upper pole in 13, focal cystic lesion in hilum in 9, focal solid upper pole in 14, focal solid upper hilum in 8 and diffused cystic+ solid upper+ hilum+ lower pole in 12 cases. Pathological diagnoses were vascular malformations in 10, congenital epithelial cyst (CEC) in 29, hamartoma in 3, leiomyoma in 6, lymphangioma in 2, CEC+ hemangioma in 1 and sclerosing angiomatoid nodular transformation (SANT) in 5 cases. Surgery performed was total splenectomy in 30 and partial splenectomy in 26 cases. Zvizdic Z et al[14]presented a case of a large splenic mesothelial cyst and its treatment with preservation of the remaining splenic parenchyma. During clinical evaluation, abdominal ultrasonography revealed a solitary splenic cyst located in the central part of the spleen with a maximum diameter of 4,4 cm with smooth wall and anechoic central areas. The patient had no history of trauma or infection. Physical examination revealed nothing abnormal, but mild tenderness was found in the left hypochondriac region. Follow-up abdominal ultrasonography, performed 3 and 6 months after the

initial ultrasonography, and MR, performed 6 months after the detection of splenic cyst, showed a moderate growth of the cyst (the cyst measured 6,24 x 6,07 x 5,96 cm in size). The patient was transferred to the Department of Pediatric Surgery. Since the diameter of the cyst was larger than 5 centimeters and the cyst showed progressive growth, they found that there was an indication for open surgical treatment. They showed that spleen-preserving surgery in treatment of the large splenic cysts is possible and safe procedure with maintenance of the splenic function.
The shortcoming of the study is small sample size.

CONCLUSION

A summary of the different clinical features of benign splenic lesions in children is provided. Vascular malformation and congenital epithelial cysts are the most frequent pathological diagnosis. Both partial and whole splenectomy have good prognoses and low rates of recurrence; if at all possible, the former is recommended to maintain splenic function.

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