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General Surgery

SPLENIC CYSTS- A REVIEW

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ABSTRACT Even as primary pathologies of spleen are unusual, cysts arising from spleen are very rare. On presentation of a patient with left hypochondriac mass and possibility of primary splenic cyst as a diagnosis, we took a systematic review of cystic lesions of spleen, pathogenesis, diagnosis and basis of their management, in regard to use of imaging studies and surgical approaches to the cyst either as total or partial splenectomy.

KEYWORDS : Splenic cyst, Epithelial cyst, Splenectomy, Computed tomography

The spleen was regarded as "an organ of mystery". Often regarded as a mass without any function other than counter-balancing weight of liver. Some had even blamed spleen for hindering speed of runners.

In 1929, Andral first described a dermoid splenic cyst at autopsy. Pean performed the first recorded splenectomy for a cyst in 1867.

Splenic cysts pose difficult challenge to clinicians. With more knowledge about functions of spleen and surgical splenic conservation techniques, now splenic cysts can be easily dealt with. Also, preoperative diagnosis is more confirmatory with Ultrasound, Computed Tomography and Magnetic Resonance techniques.

On review of literature, we found out that the splenic cysts are rare and pathogenesis is less understood. In this review article we have summarized about the splenic cyst in reference to a case.

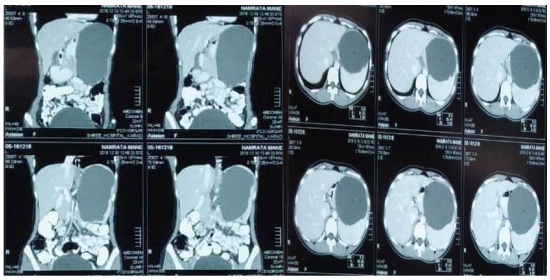
Case Report:
A 20 year old female, resident of rural area came to surgical OPD with a complaint of swelling and fullness of abdomen in the left side. On examination the mass was felt to be arising from left hypochondriac region, most probably spleen. There was no significant medical or surgical history in past.

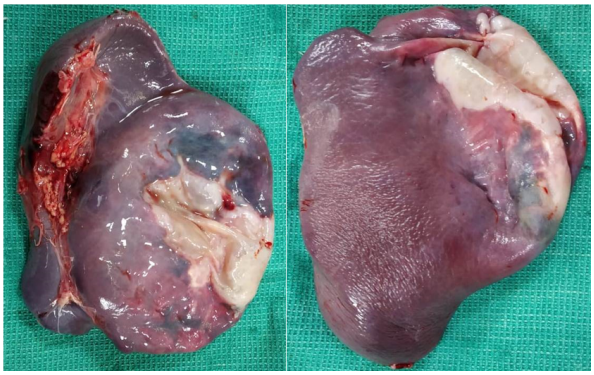
On radiological investigation, it was found to be a splenic cyst which was of size 16 x 10 x 10 cm with homogenous enhancement on contrast. It was arising from the inferior aspect of spleen with compression of normal splenic parenchyma and encroachment on the splenic hilum. There were no cysts elsewhere in the abdomen.

Patient was investigated for hydatid disease and routine blood work up. There was no significant abnormality found with the reports, patient was immunized for encapsulated bacteria and was subjected for surgical treatment as excision of splenic cyst. During laparotomy it was found that the cyst was encroaching upon the hilum .Total splenectomy was performed with total cyst removal.

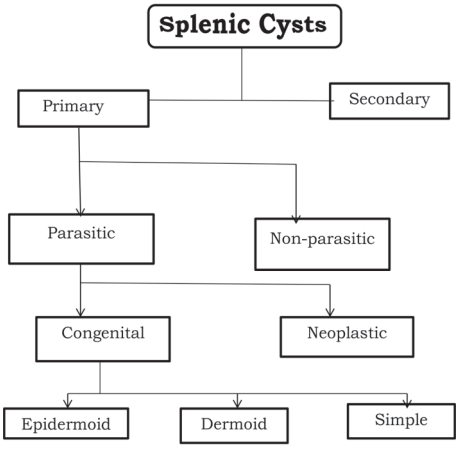
The cyst was filled with yellowish crystalline fluid of almost 800ml which was sent for culture and biochemical evaluation. There were no septations within the cyst. There was no organism isolated from the fluid and content of amylase and cholesterol of the fluid was also minimal.

On histopathology it was confirmed to be primary epithelial splenic cyst with cuboidal epithelial lining with fibrocollagenous tissue. The patient had normal post-operative recovery and was discharged on day 5.





Material & methods-
The research articles and case reports published in English were studied for this review from PubMed. The keyword of each research was: splenic cyst. Total review of aetiology, pathogenesis, diagnostic techniques and treatment options were studied.



Incidence & types-
Splenic cysts are rare clinical condition with 0.07% incidence. They are classified as primary (true) and secondary (false) cysts. Primary cysts are subdivided into parasitic and non-parasitic cysts. Non-parasitic cysts are commonly congenital, while most common parasitic infestation leading to cyst formation is Ecchinococcus granulosus.

Non-parasitic primary cysts are either congenital or neoplastic. Congenital being epidermoid, dermoid and endodermoid cysts. The epidermoid cysts can result from either embryonic inclusion of epithelial cells nom adjacent structures followed by cystic dilatation, or be the result of an invagination of the capsular surface mesothelium. Epidermoid cysts can also follow trauma with metaplasia within mesothelial cysts. Epidermoid cysts should be classified as primary, as they are mesothelial in origin and have focal squamous metaplasia.

The cystic wall of the epidermoid type appears to be fibrotic with a variety of trabecular architecture, probably due to reorganization of stroma/luminal bleeding with a content of yellow proteinous Liquid. Dermoid cysts are extremely rare. They are considered to be cystic teratomas and contain structures derived from the three germ layers. The endodermoid cysts are not true cysts, but are rather a cystic vascular lesion composed of several ectatic vessels. They should be classified as a lymphangioma or hemangioma.Cystic neoplastic tumors can, in addition to parasitic and congenital splenic cysts, be found in the spleen. The epidermoid subtype accounts for 90% of the primary non-parasitic cysts, while the dermoid cysts accounts for most of the remaining cases.

Secondary cysts- The spleen is the most commonly injured intraperitoneal organ following abdominal trauma.According to the type and intensity of the trauma, the site of the vascular injury in the parenchyma, the blood coagulation pattern and an intact splenic capsule, an intraparenchymal or subcapsular hematoma may result. Organization, liquefaction, resorption, and encapsulation may lead to the formation of a pseudocyst, Apparently posttraumatic cysts account for 75% of all nonparasitic splenic cysts, although 30% of patients do not recall any trauma. Secondary cysts might also develop because of splenic infarcts or infections (eg, mononucleosis, tuberculosis, or malaria), which enlarges and makes the spleen more vulnerable. The pseudocyst contains a liquid mixture of blood and necrotic debris. The wall of the posttraumatic cyst does not have an epithelial lining and deposited hemosiderin is often detected microscopically, However, haemorrhage may also occur in the case of primary cysts. Furthermore, the epithelial lining of the primary cyst can be atrophic,which sometimes make the primary cysts difficult to be distinguished nom secondary cysts. Clinically it is not possible to distinguish between primary and secondary cysts, although adhesions are reported to be associated with secondary cysts. Additionally the parasitic cysts are more frequently multilocular, whereas the nonparasitic cysts most often appear to be unilocular.

Presentation-

Most of the cysts are detected by the physical examination. Around 70% of the patients do have symptoms due to splenic cysts. A painless abdominal mass may be associated with nausea, vomiting, weight loss. Rarely constipation can present along with the mass. Pain is an infrequent symptom.

Diagnosis-

It is mainly based on radiological findings

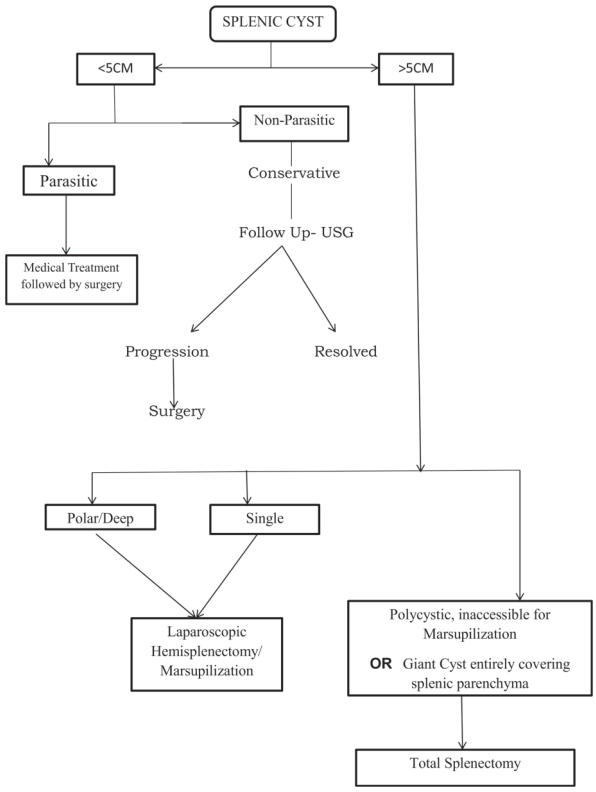
1) **Ultrasound-** the typical splenic cyst appears as a round homogeneous, anechoic area with marked echo enhancement and with a smooth, thin wall.
2) **Computed Tomography-** At CT, with helical scanning after bolus contrast material administration, splenic cysts are typically spherical, well-defined lesions with attenuation near water and a thin or imperceptible wall and no rim enhancement. Cyst wall calcifications and septations are well demonstrated.
3) **Magnetic Resonance-** On both TI- and T2-weightedMR images, splenic cysts typically have a signal intensity equal to that of water; however, depending on the composition of the cystic fluid (eg, serous or hemorrhagic), the signal intensity on TI-weighted images may be increased, whereas the signal intensity on T2-weighted images remains high. MR is also useful to achieve a view of the relationship between the cyst, the spleen, and the surrounding organs.

How to Approach-

The splenic cysts as a differential diagnosis should be considered when congenital cysts are suspected in a young aged patient with asymptomatic mass of spleen without any evidence of haematological abnormality.

A secondary cyst should be considered when there is significant history of trauma and haematological changes along the mode of injury.

Any suspicious cyst should be subjected to thorough workup of parasitic origin, Ultrasonography and Computed Tomography. CT is more accurate in differentiating the type of cyst. Also it is very less time consuming investigation when it comes to diagnosing cysts secondary to traumatic injuries or hematomas.



Splenomegaly is the most common differential diagnosis which is usually secondary to systemic disorder mostly a haematological disorder. Other possible differentials are cysts, abscesses, tumours from surrounding organs.

Management-

Treatment of splenic cysts varies according to the preference. Previously total splenectomy was favoured; but now with knowledge of splenic circulation and laparoscopic techniques it is possible to preserve spleen.

1) Non-operative treatment-

Non-operative or expectant management is considered when the cyst is less than 5cm diameter. However size should not be the absolute criteria for the surgery. Cysts less than 5cm are usually seen only on imaging modalities and are asymptomatic.

Cysts of <5cm dimensions are usually conserved with regular follow up with ultrasound with other required imaging and clinical check-ups. Any new onset of symptom, trivial trauma to abdomen, pain in abdomen should be taken into account at the follow up.

The complication to be looked after in conserved cysts is, Rupture. Rupture in primary cysts of spleen is very rare, accounting only 3 cases discussed in the available literature. Rupture often leads to hemoperitoneum, peritonitis, abscess, anaphylaxis and state of shock. Secondary cysts, arising after trauma as a primary insult have more incidence of rupture because of lack of epithelial lining.

2) Percutaneous Drainage-

Although this modality seems less invasive, frequent recurrence is the disadvantage even after use of sclerosant in the process. Along with it, dense fibrosis after the drainage therapy makes operative intervention more difficult.

3) Surgical treatment-

Classically, open total splenectomy was the treatment Of choice for symptomatic splenic cysts. Today with advances in laparoscopy, it is possible to perform partial splenectomy otherwise called as splenic conservation surgery. Conservation of spleen is recommended considering its role in regulation of circulating blood volume, hematopoiesis, immunity and protection against infections and malignancies.

Even though it is recommended to preserve spleen with total removal

of the cyst, sometimes it is necessary to perform total splenectomy when it is polycystic spleen, inaccessible for drainage, marsupialization or fenestration and when cyst is totally covering the pedicles of spleen. Also partial splenectomy in huge cysts can often lead to reactionary bleeding which cannot be tackled.

Splenectomy-

Splenectomy as a surgical approach to splenic cyst can be done as complete or partial, open or laparoscopic.

In comparison to newer laparoscopic approach to splenectomy with the open splenectomy, laparoscopic procedure offers minimally invasive technique with the maximum exposure to abdomen along with reduced morbidity and mortality with better post-operative recovery and short hospital stay. Also with laparoscopy, it becomes possible to preserve the splenic function with better cosmetic outcome than the open approach.

Complete Splenectomy-

It can be done through laparoscopic (total as well as hand assisted) or open approach. In both methods it is always advisable to preserve splenic tissue if possible. But, if the cyst or the vascular supply is getting jeopardized during excision of the cyst, total splenectomy is absolutely indicated.

Partial splenectomy-

With new considerations of immunological importance of the spleen and advancement of the minimal invasive techniques etc, it is advisable to preserve at least 25% of the splenic tissue along with its blood supply to maintain the immunological function of the spleen. Also it can be performed with low risk with laparoscopic or open harmonic scalpel. Many centres have used Argon beam coagulator along with the ultrasonic instruments. Before completion, proper hemostasis is the important marker for the operation.

Post-operative care and follow-up-

Most of the known complications of splenectomy like left lung lower atelectasis are to be looked after along with generous use of antibiotics in non-immunized patients. However, in partially splenectomised patients, regeneration of splenic tissue is confirmed with scintigraphy. Use of antibiotics after the surgery is still a debate with one group suggesting normal antibiotic coverage (5-14days post op) while other group insisting on rigorous antibiotic treatment for 3months or until adequate splenic tissue is detected.

It is advisable for regular follow-up (once every year) with ultrasound and if required CT scan imaging in conserved cases of splenic cysts. Also in operated cases of total splenectomy, follow up is recommended upto 3-6 months with proper counselling towards OPSI (Opportunistic Post-Splenectomy Infections). In partial Splenectomy cases, usually yearly follow up is recommended as to look for reappearance of any cyst.

CONCLUSION-

Although rare, splenic cysts are easily treatable entities with no possible effect on the homeostasis. Preferable modalities to diagnose such cases are USG, CT, MRI Scans and a clinician with proper knowledge of the pathology. A proper diagnosis with serology for parasitic origin is necessary.

Asymptomatic cysts with diameter <5cm can be managed conservatively with regular follow-up, however cysts with diameter >5cm should be operated after proper workup. Surgery should always aim to preserve splenic function as much as possible.

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