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Research Article

PROSPECTIVE OBSERVATIONAL STUDY OF SPLENIC ABSCESS (A STUDY OF 18 CASES IN TERM OF CLINICAL CHARACTERS, OUTCOME AND PROGNOSTIC FACTORS)

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ABSTRACT
Splenic abscess is uncommon and life threatening condition due to its nonspecific clinical picture, it remains a diagnostic challenge. It is more common in the presence of infection at different primary sites. Immunosuppression and trauma are well known risk factors. Clinical examination and laboratory finding are not constant so imaging modality is necessary tool for diagnosis. If untreated than mortality is very high. Treatment includes conservative measures and surgical interventions. Splenectomy either open or laparoscopic has been preferred approach in most centers. Now days in changing trends spleen preserving protocols especially in children's in view of importance of immunological role of spleen.

Keywords: *Splenic Abscess, Antibiotics, Drainage, Splenectomy*

INTRODUCTION
Splenic abscess is not a common entity as fewer than 500 cases reported in literature (Philips *et al.*, 1997; Liang *et al.*, 1995).
There are only few case reports of Splenic abscess from South Asian countries like India, probably due to underreporting and difficulty in diagnosis (Chun *et al.*, 1980; Anurada *et al.*, 2000; Akhtar *et al.*, 1999; Naseem, 2002) The difficulty in diagnosis is mainly due to nonspecific symptoms like abdominal pain, fever and vomiting (Anurada *et al.*, 2000).
Its incidence is ranging from 0.1% to 0.7% in various series (Chun *et al.*, 1980; Lawhorne and Zuidema, 1976; Gadacz, 1985).
Now a days Splenic abscess had various etiology like history of Splenic trauma, haematogenous or contagious spread of bacteria etc.
Patients of diabetes mellitus and immunocompromised like AIDS also have concomitant occurrence of Splenic abscess (Nelken *et al.*, 1980).
Our purpose of this study to give emphasizes the splenic abscess as high index of suspicion and liberal use of radiological studies is essential for timely diagnosis.

MATERIALS AND METHODS
This study was conducted in tertiary referral centre M.G. medical college and hospital Jaipur from January 2012 to January 2015. Total 18 pts were enrolled. The medical record of patients reviewed. Data which is extracted from medical record was age, sex, symptoms, sign, predisposing conditions, bacteriological profile, treatment type and outcome of treatment were recorded.
The main clinical features like unexplained fever, diffuse or localized pain in abdomen, nausea and splenomegaly were rated.
Systemic diseases were noted like DM, HT, benign or malignant liver or pancreatic disease, recent abdominal trauma, immunosuppressive state or endocarditis.
Diagnosis was confirmed by USG/CT scan, solitary v/s multiple lesion were categorized by imaging studies.
The pts also categorized on bacteriological profile by percutaneous needle aspiration from abscess. In addition pt that underwent splenectomy intraoperative culture of these pts was taken.
Three categories were made on treatment modality

1) I.V. antibiotics only
2) Percutaneous drainage + I.V. antibiotics
3) Antibiotics + splenectomy

Outcome in favor of improvement of symptoms, complications, morbidity and mortality among pts in each group were compared.
All data were expressed as mean +_S.D. and statistically analyzed with chi-square test. A p value <0.005 was considered significant.

RESULTS AND DISCUSSION

Observation and Results

In our study we had 18 patients. In which 11 were male and 7 pts were female.
The mean age of patients was 37.22 +_ SD 13.43 ranging from 16 to 60 yrs of age.
The common symptoms or salient clinical features were fever 16 pts (85%), abdominal pain 8 pts (46%) and leucocytosis 17 pts (87%).
The physical examination reveals that only 50% pts (9 pts) have mild tenderness in left hypochondrium.
In our study we found that majority of pts 50% (9 pts) were admitted in medicine department with a provisional diagnosis other than Splenic abscess such as DM, CLD, Unexplained fever and reference was seen by surgeons for mild abdominal tenderness.
In our study 12 pts had chronic liver disease which was mostly alcoholic liver diseases. Two pts had previous episodes of pancreatitis that develops latter on splenic abscess.
In our study we found 6 pts who had history of blunt trauma abdomen with splenic injury, who develops latter on splenic abscess.
In our group DM was a very common co morbid condition.
In our study 9 pts were confirmed by USG, 6 pts required CT scan to confirm the diagnosis of splenic abscess and in 3 pts both the modalities were required.
In our study solitary abscess seen in 4 pts only and 14 pts had multiple abscesses in spleen.
Abscess sizes were 1 to 7 cm in disease. While 80% pts of have <5 cm and 4 pts have 6 to 7 cm size of abscess.
All pts in our study send blood or splenic pus for culture sensitivity-
40% pts shows monomicrobial
38% not show any growth on culture
22% polymicrobial in nature
The most common organism was E.Coli 20% and staphylococci 20% followed by klebsiella.
Eight pts received parenteral antibiotics as the sole treatment for splenic abscess, GROUP 1.
Four pts had additional percutaneous drainage with pigtail like catheters GROUP 2.
Six pts had undergone with splenectomy because of multiple abscess GROUP 3.
In group 1 treated only with antibiotics, duration of hospital stay was 13.71 days (SD 9.08) with survival rate 62%. Three pts in this group dies due to sepsis and co morbid conditions.
The pts of group 2 and 3 had on average hospital stay 11.67 days and 15.67 days respectively. The survival rate was 75% and 83% respectively.
One pts of group 3 dies due to post operative pneumonia.
The crude mortality rate was 27.22% in our study. The poor prognostic factors were DM and other underlying co morbid conditions.
The other poor prognostic factors were age >40 yrs and abscess size >5 cm in size.
But no variable were statistically significant to predict the mortality in splenic abscess.

Tables 1: Patients characteristics

AGE	**16-60 YRS**	**Mean +_SD 37.22 +_13.43**
M:F RATIO	11:7	

Table 2: Presenting symptoms and signs

Fever	**85%**	**16pts**
Abdominal pain	46%	8pts
Nausea and vomiting	42%	7pts
leucocytosis	86%	17pts

Table 3: Predisposing factors

Parenchymal liver disease	**66%**	**12pts**
Diabetes mellitus	55%	10pts
Pancreatitis	11%	2pts
Abdominal trauma	33%	6pts
Immunosuppression	6%	1pts
Endocarditis	6%	1pts

Table 4: Diagnostic radiology

	Antibiotic only (8 pts)	**Percutaneous drainage (4pts)**	**Splenectomy**
USG (9 pts) single/multiple	5 (0/3)	2 (2/0)	2(1/1)
CT scan (6pts) single/multiple	2 (0/2)	1(1/0)	3(1/2)
Both (3pts) single/multiple	1 (0/1)	1(1/0)	1(0/1)

Table 5: Comparisons of three groups

Group	**N**	**Hospital stay**	**Survival rate**
Antibiotics alone	8	13.71 days	5/8 (62%)
Percutaneous drainage	4	11.67 days	3/4 (75%)
Splenectomy	6	15.11 days	5/6 (83%)

Table 6: Prognostic factors

Variables	**Category Number**	**Mortality**
Genders	Male 11	1
	Female 7	1
DM	Present 10	2
	Absent 8	0
Size of abscess	>5 cm 4	1
	<5 cm 14	0
Treatment	Antibiotics 8	2
	Drainage 4	1
	Splenectomy 6	1

Discussion

Splenic abscess that has been considered as an uncommon disease is recently being reported with increased frequency. Two main factors to increase in numbers of cases of splenic abscess are the advancement in imaging studies and a greater no of pts who have associated predisposing factors for splenic abscess like DM, cancers, immunocompromised status. Not only there is increase in numbers of

cases of splenic abscess due radiological improvement, there is mean age of pts was 37.22 yrs seen in our study which is considerably lower than that reported in older studies (Chun *et al.,* 1980; Nelken *et al.,* 1987).

The fever was the most common symptom seen in our pts followed by abdominal pain and nausea, vomiting. The triad of fever, Lt upper quadrant pain and tender mass suggested by Sarr and Zuidemia (1982) as the presenting complex of Splenic abscess. We could not appreciate the presence of tender mass on physical examination in the majority of our pts. Leucocytosis (WBC >10,000) is most common abnormal lab finding.

The diagnosis of splenic abscess required imaging studies. USG was commonly used to examine the abdomen. However there was a pt in our study that requires additional CT scan of abdomen to confirm the diagnosis of splenic abscess. Additional CT scan offers an advantage to better evaluate the contagious infective source (s) than USG.

Bacteria were usually the pathognomic agents that accounts for Splenic abscess (Hadas-Halpren *et al.,* 1992).

Rarely fungi and protozoa are encountered, especially in immunocompromised pts. Both Gram positive and Gram negative organism have been implicated in Splenic abscess (Nelken *et al.,* 1987; Chang *et al.,* 2006; Green, 2001).

Staphylococcus aureus and E.coli were the most common bacteria from the patients in this study followed by K.Pneumonie.

9 pts were treated with antibiotics alone, 4 pts percutaneous drainage and 6 pts underwent splenectomy.

Percutaneous drainage is generally preferred treatment modality in unilocular and thin content of abscess and peripherally located abscess (Hadas-Halpren *et al.,* 1992; Chou *et al.,* 1998).

It prefers immunologic function to spare, especially in children, pts who are usually septic, severe ill, and are at high risk for surgery and anesthesia.

In our study 44% of pts were treated nonsurgically with antibiotics alone, in which 3 pts dies not directly related to primary condition but because of associated malignancies and other issues.

Medical therapy was selected in the group of pts with small size abscess, multiple abscess, thick material abscess, not candidate for surgery. In this group survival rate was 62% (Sarr and Zuidema, 1982; Tung *et al.,* 2006).

Splenectomy has been most effective and definitive procedure for managing splenic abscess. Most studies report mortality rate 0% to 20% during open splenectomy for splenic abscess (Nelken *et al.,* 1987; Green, 2001).

Although higher morbidity rate are associated with this procedure, it remains the only viable treatment option, especially for pts with multiple abscess, failed Percutaneous drainage and also for recurrent abscess.

So over all splenectomy is still considered standard of care for Splenic abscess (Carbonell *et al.,* 2004; Ulhaci *et al.,* 2004). However most recent studies prefer to laparoscopic splenectomy (Gigot *et al.,* 1994; Zerem and Bergsland, 2006; Martinez *et al.,* 2008).

Conclusion

However splenic abscess pts are not commonly found in general scenario but high degree of suspicion should be kept in mind for pts with fever, abdominal pain and leucocytosis and along with co morbid condition for Splenic abscess.

CT scan is currently considered the gold standard to establish the diagnosis.

No study is available to determine the most effective treatment of splenic abscess.

Early diagnosis, individualized management is mandatory to decrease morbidity and mortality.

In view of diverse pts population, pts selection for splenic interventional modality is very important to improve prognosis.

Currently splenectomy must be considered as the most reliable treatment of this condition but must be considered when other less invasive method fails.

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