Research Article

Role of aspiration cytology in splenic lesions

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Received: 02 March 2016
Revised: 14 January 2016
Accepted: 07 April 2016

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ABSTRACT

Background: Splenic fine needle aspiration cytology (FNAC) as a diagnostic procedure has been used since beginning of last century and was first reported in 1916. The objective of the study was to evaluate the diagnostic role of aspiration cytology in splenic lesions.

Methods: In our retrospective study Fine needle aspiration cytology (FNAC) of spleen was done in a total 34 cases, out of which 28 cases were aspirated under ultrasonological guidance and 6 cases were aspirated blindly. There were 23 male and 11 female patients and the age range of the patients was from 2 to 69 years with 8 patients from paediatric group. Before commencing the procedure all the necessary precautions and investigations including coagulation profile were done.

Results: Out of 34 FNAC cases, 5 were bloody aspirate while 2 cases showed normal splenic aspirate. In 27 cases definite diagnostic opinion was possible. Amongst non-neoplastic group maximum patients (8 cases) were showing features of extra medullary hematopoiesis followed by 4 cases of tuberculosis, then 3 cases each of kala azar and storage disorder and 2 cases showed granulomas. In the neoplastic group, we had 2 cases of non-Hodgkins lymphoma, one case of Hodgkin lymphoma with 2 cases of hairy cell leukemia and one case of histiocytosis. No major difference in the cellularity noticed when the aspiration done blindly or under ultrasound guidance No procedural complications were seen in our study.

Conclusion: Hence when done with full precautions FNAC spleen is a safe, cheap, rapid and highly diagnostic procedure as a primary investigation.

Keywords: Spleen, FNAC, Ultrasonography, Tuberculosis, Lymphoma, Leishmaniasis

INTRODUCTION

The FNAC has become quite popular diagnostic modality now days. Splenic fine needle aspiration cytology (FNAC) as a diagnostic procedure has been used since beginning of last century and was first reported in 1916.1 Although many authors from different centers have highlighted its utility for diagnosing splenic pathology, it is used routinely in very few cases. It has the reputation of being a dangerous intervention and the specimen obtained is usually thought to be unduly difficult to assess, but these prejudicial ideas are fundamentally wrong.2-8 FNAC is a safe, easy, simple, reproducible and rapid diagnostic procedure and has distinct advantage over open true cut or core biopsy. As it requires no special instrument and incur no significant trauma and cost to the patient. Although radiological modalities like ultrasound, CT scan, or MRI usually narrow down the differential diagnosis but rarely provide a definitive picture and tissue sample in form of an aspirate or a biopsy is required to clinch a specific diagnosis.9-15 In these circumstances, FNAC remains the first mainstay diagnostic investigation. Splenic pathology can be localised or secondary to systemic involvement in various diseases. The indications of splenic FNAC8,14,16 are non-
neoplastic diseases like infectious diseases, storage disorder, sarcoidosis, amyloidosis, hemophagocytic syndrome and neoplastic conditions like different haematological and metastatic epithelial tumours. In this present retrospective study, we have explored the role of FNAC in splenic lesion in a multidisciplinary tertiary healthcare centre.

METHODS

This retrospective study included 34 cases of splenic aspirations under ultrasound guidance (28 cases) and blind aspirate (6 cases). Detailed clinical profile, treatment history and other related pathological investigations were recorded. Patient consents were taken and coagulations profile was done in all the cases before doing FNAC. In all cases, the minimum cut-off limit for platelet was 50,000/mm³ and the prothrombin time and Activated partial thrombin time were in normal limit. The ultrasound guided FNACs were performed by the joint collaboration with radiologist using a 22 gauge spinal needle along with 20 ml syringe.™ Blind splenic aspirate were done with 23 gauge needle without lapse of time in a quick stab like fashion, using non-aspiration technique and area was pressed for five to ten minutes. The aspirated material was used to prepare multiple air-dried and wet fixed smears. Both May-Grünwald-Giemsa (MGG) and Papanicolaou stain were done routinely in every case. Special stains like Ziehl Neelson (ZN), and Periodic acid-schiffs (PAS) were used wherever required. The cytology slides were examined under microscope and diagnosis was correlated with other clinic pathological findings in these patients.

RESULTS

A total of 34 cases of splenic lesions were aspirated and out of which 23 were male and 11 were female (M: F-2.09:1) and 8 patients were from pediatric age group. The age range of the patients was from 2 to 69 years (Table 1).

Table 1: Age and sex distribution.

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of Cases</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>2</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10-19</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>50-59</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>60-69</td>
<td>3</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>11</td>
<td>12</td>
</tr>
</tbody>
</table>

Of these 34 cases, 5 samples (14.7%) had bloody aspirate, 2 cases (5.9%) did not show any specific pathology (normal/reactive/no evidence of malignancy) and 27 cases (79.4%) showed specific pathology. The most common clinical presentation was pain in abdomen with splenomegaly (38%) followed by pyrexia of unknown origin. The distribution of splenic FNAC cases is highlighted in Table 2. In our study among non-neoplastic group maximum patients were from extra medullary hematopoiesis that is (23.5%) followed by 5 patients (14.7%) of tuberculosis (with the demonstration of acid fast bacilli) and 2 cases (5.9%) were reported as granulomatous inflammation. We reported 3 case (8.8%) of Kala azar and 3 (8.8%) cases of storage disease. In the neoplastic group, we encountered 2 cases of (5.9%) Non-Hodgkin’s lymphomas, 1 case (2.9%) of Hodgkin’s lymphoma and 2 cases (5.9%) of Hairy cell Leukaemia and 1 case (2.9%) of Histocytosis (Table 2).

Table 2: Distribution of cases.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>No. of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra medullary</td>
<td>8</td>
<td>23.5%</td>
</tr>
<tr>
<td>Hematopoiesis</td>
<td>6</td>
<td>17.6%</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>3</td>
<td>8.8%</td>
</tr>
<tr>
<td>Kala azar</td>
<td>2</td>
<td>5.9%</td>
</tr>
<tr>
<td>Storage disease</td>
<td>2</td>
<td>5.9%</td>
</tr>
<tr>
<td>Granulomatous condition</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>No Hodgkin's lymphoma</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>Hairy cell leukemia</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>Hodgkin's lymphoma</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>Histocytosis</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>Normal/ Reactive</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>Bloody aspirite</td>
<td>5</td>
<td>14.7%</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Table 3: Comparison of USG guided FNAC with blind procedure.

<table>
<thead>
<tr>
<th>USG guided FNAC</th>
<th>Blind Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usefull results</td>
<td>Bloody aspirates</td>
</tr>
<tr>
<td>No. % of cases</td>
<td>No. % of cases</td>
</tr>
<tr>
<td>24</td>
<td>85.7</td>
</tr>
<tr>
<td>14.3</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

In our all cases of neoplastic pathology in splenic FNAC, we had primary diagnosis available either by histopathology or by FNAC of the primary lesions. All the lymphoma (2 non-Hodgkin lymphoma, 1 Hodgkin lymphoma) and Hairy cell leukaemia secondarily involved the spleen.

We did not found any case of metastatic carcinoma in our study.

DISCUSSION

For diagnosing splenic pathology, the tissue can be obtained by either by splenectomy specimen/core biopsy/FNAC. Splenectomy is avoided now a day, to
prevent OPSI (overwhelming post splenectomy infection) and core biopsy also not done routinely as danger of postop haemorrhage. FNAC is found to be a investigation of choice in multidisciplinary setting, with the team of pathologists, radiologist and clinician.17-19 The spleen is a very vascular organ and rarity of splenic FNAC is due to the fear of complications like haemorrhage and rupture, which can be avoided when patient is cooperative and with emergency backup. In our study no procedural complications were seen while other studies have reported 0.5-1% complications.7,20,21 Our maximum cases (23.5%) showed features of extra medullary haematopoeisis like scattered megakaryocytes, myeloid and erythroid cells along with polymorphous lymphoid cells. This occurs in setting of hemolytic anemia and in myeloid metaplasia and Austin et al and Zeppa et al in two separate studies reported the same.22,23 (Figure 1)

Figure 1: Splenic aspirate showing extramedullary hematopoiesis (Leishman x 700).

Amongst infectious causes we found 5 cases (14.7%) of tuberculosis with AFB demonstration in smears while in 2 (5.9%) cases just reported as granulomatous inflammation. In other studies incidence of splenic TB diagnosed by splenic FNAC was quiet high (Figure 2).24,25

Figure 2: Granuloma formation in splenic tuberculosis (Leishman x 700).

We diagnosed 3 cases (8.8%) of Kala azar on splenic aspirates by demonstrating numerous safety pin like organisms in macrophages and outside. Our these cases presented with pyrexia of unknown origin with huge spleen and these findings are in accordance with the study by Thakur et al.26,27

We did not find any case of malarial spleen or other bacterial and fungal infection.27 However the role of splenic FNAC in these infections is well documented.28

Amongst neoplastic group, we had primary diagnosis available. There were 2 cases (5.9%) of non hodgkins lymphoma. Both were of high grade. While in one case (2.9%) of hodgkins lymphoma, splenic aspirates showed scattered Reed Sternberg cells with polymorphous cell population. Splenic involvement help in staging of lymphoma. Also in some other studies similar findings were there (Figure 3).29,30

Figure 3: Splenic aspirate, showing infiltration by Hodgking's lymphoma (Leishman x 280).

We also encountered 2 cases (5.9%) of hairy cell leukaemia. Hairy cell leukaemia is an uncommon but distinct lymphoproliferative disorder of B cell origin. It usually affects the spleen, bone marrow and uncommonly involve lymph node. There are only a few case reported where hairy cell leukaemia was diagnosed on FNAC spleen (Figure 4).31,32

Figure 4: Hairy cell in splenic aspirate, in hairy cell leukaemia (Leishman x 700).

In our study we encountered a child (2.9%), a case of histiocytosis involving cervical lumph nodes and splenomegaly. On aspiration from spleen we found similar langerhans type histiocytes, as were infiltrating the lymph nodes. Very few studies have been done on cytological study of histiocytosis involving the spleen (Figure 5).33

Figure 5: Histiocytes in splenic aspirate (Leishman x 700).
We did not find any case of metastatic carcinoma, although spleen is not a rare site for carcinoma to metastasize. Gochhait D et al. found 10 cases of metastatic carcinoma, out of total 54 cases of splenic aspirates while Kumar PV et al reported 6 cases of metastatic CA.

In our study 3 cases (8.8%) of storage disorder, showed cellular splenic aspirates, having lipid containing macrophages with crumpled tissue paper cytoplasm and eccentric nucleus. Zeppa et al, Kobayashi et al and Mumtaz et al also reported lipid storage disorder on splenic aspirates. (Figure 6)

In our study, only 2 cases (5.9%) showed reactive picture. This means that there were no likely possibility of neoplastic lesion or storage disorder. However focal involvement of spleen, in metastatic malignancies may show reactive changes and mislead the actual diagnosis.

In our study, out of 34 cases, 28 cases were aspirated under ultrasound guidance while 6 cases were aspirated blindly. No major difference in cellularity noted by aspiration or non-aspiration technique/ USG guided or blind procedure. However useful results were obtained in 24 (85.7%) cases, when the procedure was performed under USG guidance as compared to 5 cases (83.3%) if procedure was performed blindly (Table 3).

CONCLUSION

So we conclude, splenic FNAC is a rapid, cheap, highly diagnostic, reproducible and safe procedure, if performed under full precaution and avoid unnecessary need of splenectomy.

In the modern era of diagnostic world if combined with new ancillary techniques, it could be of great help in early and accurate diagnosis and treatment of the specific disease.

ACKNOWLEDGEMENTS

We acknowledge help of residents in Department of Pathology, statistician in department of statistics, photographer, our patients, our families and almighty.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES


