RADIOLOGICAL APPROACH TO DIAGNOSIS AND MANAGEMENT OF SUBPHRENIC ABSCESS

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SUMMARY

Post laparotomy subphrenic abscess is a surgeon’s nightmare. Mortality due to these abscesses is relatively high compared to other post-op. complications. It can be significantly reduced by early diagnosis and management. Ultrasoundography (USG) guided drainage without reopening has given surgeon’s a sigh of relief. In this study, 30 cases of subphrenic abscess (SPA) were diagnosed and 23 drained successfully. Other routine procedures to diagnose SPA did not prove superior to USG, however in left sided SPA a conventional radiograph of abdomen was equally useful. USG allows rapid diagnosis with minimal requirements and simple approach for management.

INTRODUCTION

Excessive and routine use of antibiotics to cover post laparotomy sepsis results in delayed and non-specific signs and symptoms with difficulty in localization. However, with the improved knowledge of anatomy of different compartments where most collections take place and advancements in sectional imaging, the approach to SPA has dramatically change. Subphrenic spaces are no longer limited to that sites but are in continuation with spaces above and below i.e. extend from above the diaphragm to transverse-mesocolon & transverse colon below i.e. the supra-mesocolic compartment of abdomen. The two Subphrenic areas i.e. the right and left. Subphrenic areas are further divided into two sub-compartments. Right into supra and sub-hepatic spaces. These spaces communicate with lesser sac through the foramen of Winslow. Infero-laterally are related to right para-colic gutter.

On left side it is divided into two spaces, the subphrenic space and lesser sac. Gastric fundus and splenic flexure are in close proximity to both subdivisions.
Second space the lesser sac lying posterior to stomach against posterior abdominal wall in relation to pancreas extends upwards to gastric fundus with extensive relationship with left hemi-diaphragm posteriorly. Medially it communicates with right subphrenic space via foramen of Winslow.

**MATERIAL AND METHODS**

30 cases of SPA were diagnosed by conventional radiological procedures and confirmed by USG. 23 were later managed by radiology department by Per-cutaneous Abscess Drainage (PAD) technique.

These cases were referred to Radiology Department of Khyber Teaching Hospital by different surgeons and a few by physicians. Cases were both indoor admitted patients as well as outdoor. Indoor patients were on an average 3-10 days post-laparotomy. These cases were referred for post laparotomy high temperature suggesting an inflammatory focus.

Outdoor cases were mostly 4 weeks to 1 year and 6 months old, all had undergone laparotomy. Most presented with high temperature others in addition had upper abdominal pain and a few tenderness. Thus time of presentation varied from 3 days to 18 months.

Laparotomy was done for gastrectomy, perforated peptic ulcer, traumatic perforation of gut, appendectomy, splenectomy, lacerated liver, pancreatitis, liver abscess, colonic surgery, biliary surgery and others.

**RESULTS**

Most of these cases had undergone routine investigations. Chest PA and Abdomen erect and supine films were taken. Majority showed a combination of signs in films. 21 showed ipsi-lateral elevation of hemi-diaphragm. 3 had local skin elevation, redness and fluctuating swellings. These cases were of right SPA with extension to lateral surface of liver. 14 showed pleural effusion and 8 in addition had basal consolidation. Effusions had adhesions in few cases. Loss of diaphragmatic margins was noticed in all cases of effusion and consolidation. 13 showed high right hemi diaphragm showed air/fluid levels in erect abdominal films. 14 had air/fluid level under diaphragm, 3 had air/fluid levels in gut and 4 had gas less soft tissue masses under left hemi-diaphragm.

2 showed spontaneous drainage through incision wound. 11 of these cases had abscesses in 2 spaces. 1 had multiple abscesses and rest single space abscesses. 4 had both SPA and intra-peritoneal abscess. Cases with two spaces and multiple abscesses also showed pelvic collection.

Fistula with bowel was present in 3 and with biliary system in 2. I had empyema thoracic after perforation.

USG was done in almost all as routine to confirm and localize the abscesses. Major findings were hypo-echoic to iso-echoic, well circumscribed fluid collections, thick membranes or septations, gas bubbles and debris. In addition reduced diaphragmatic excursion and presence of fluid above the diaphragm with or without basal consolidation was also seen. On thorough examination extension to more than one locations without any localizing signs was noticed. In very few cases USG could not properly localize the site due to ileus and excessive bowel gas anterior to it. Overlying antiseptic dressings also posed difficulty in very few cases.

Conservative management is not favoured until critically ill. Drainage with different needles, specific catheters and even use of Foley’s catheter have been tried with high rate of success.
Suitable antibiotic cover was provided to avoid further spread of sepsis and to wall-off the collection.

After diagnosis and localization of collection a suitable rout of approach was adopted considering the following:
- Shortest pathway
- Easiest angulation or localization
- Avoidance of intervening and adjacent structures and
- Most convenient catheter location for patient.

PAD was performed using standard aseptic technique and local xilocain anesthesia. Diagnostic aspiration with fine bore lumbar puncture needle was done followed by catheter placement, if fluid was purulent. In resistant collections daily catheter wash and aspirations were carried out for 3-4 days and in few cases upto 8 days.

Simple abscesses of less than 5 cm diameter were treated by aspiration alone. When proper catheters were not available polyethylene angio-graphic pigtail catheters venocaths or even Foley’s catheters were used with equally good results.

**Discussion**

Sepsis spreads along visceral contours and communications of spaces.\(^8\) Main path is right para-colic gutter, resulting in commonest subphrenic and pelvic abscesses.

Posterior hepatic recess of sub-hepatic space is the most dependant part so infection gravitates here in supine position.\(^9\) Negative upper abdominal pressure due to diaphragmatic movement is again an important causative factor for upward flow.\(^10\)

SPA is primarily an abdominal disease and assessment needs more than a routine chest PA radiograph. It requires abdominal screening, previously by fluoroscopy and now by USG. Conventional radiographs in addition to chest film should include abdominal erect and supine position films. A lateral or cross-table film can further improve localization.

Majority of abscesses in abdominal films were diagnosed because of presence of air/fluid levels or gas free soft tissue masses. Ileus with air/fluid levels reduces the chances of proper detection.

Because of few restrictions of conventional radiography in diagnosing abscess, USG is of immense importance. It’s only limitation is excessive bowel gas\(^11\) anterior to it, on contrary fluid filled gut loops are helpful in localizing the abscess.

Fluoroscopy\(^12\) is almost obsolete now in the presence of USG and CT. Sinograms with contrast materials, in cases of collections communicating with exterior are helpful in defining the tracts of discharge so is the case with fistulogram.\(^13\)

CT has made the diagnosis and localization of abscess almost certain,\(^14\) however, availability of facility, prolonged wait time and cost are the limiting factors.

PAD is an aggressive practical approach with relatively simple devices and technique it yields high success rate\(^15\) and few complications. Risks are nominal as long as PT and Platelets count are normal.

Cases treated conservatively in addition to PAD did well compared\(^9\) to the cases treated conservatively or surgically alone.

PAD (per-cutaneous abscess drainage) replacing open surgical abscess drainage in all but the most difficult or inaccessible cases was done. Even septated and viscous fluid collections were successfully treated with adjunctive lytic agents like streptoki-
nase. Fistulae with bowel settled in one of our cases after drainage.

REFERENCES


