IDIOPATHIC RIGHT SUB-PHRENIC ABSCESS CONTAINING GAS

Muhammad Umar Amin, Mobeen Shafique, *Rabia Mahmood, Sajid Ali Mustafvi

Combined Military Hospital Bahawalpur, *Fauji Foundation Hospital Rawalpindi

INTRODUCTION

The subphrenic space is arbitrarily defined as lying below the diaphragm and above the liver. About 55% of subphrenic abscesses are right-sided, 25% are left-sided, and 20% are multiple [1]. Most subphrenic abscesses arise from direct contamination after surgery, local disease, or injury. They develop from peritonitis secondary to another cause, such as a perforated viscus; extension from an abscess in an adjacent organ; or, most commonly, as a postoperative complication of abdominal surgery, especially on the biliary tract, duodenum, or stomach [2]. Nonproductive cough, chest pain, dyspnea, and shoulder pain may result from the effects of the infection on the adjacent diaphragm, and rales, rhonchi, or a friction rub may be audible. Dullness to percussion and decreased breath sounds are present when basilar atelectasis, pneumonia, or pleural effusion occurs [3]. The mortality rate of subphrenic abscesses is 25 to 40%; deaths occur from uncontrolled infection, malnutrition, and complications of prolonged hospitalization such as pulmonary emboli and nosocomial infections. Subdiaphragmatic abscesses may extend into the thoracic cavity, causing an empyema, a lung abscess, or pneumonia [4].

CASE REPORT

A 33 years old male patient was admitted with complaints of low grade fever and pain in the right hypochondrium for 15 days. There was history of drug addiction (Marijuana) for 5-6 years. There was no history of intravenous drug abuse 3. There was no history of blunt or penetrating abdominal trauma, any surgical procedure or peptic ulcer disease. On examination, hepatic dullness was absent, breadth sounds and bowel sounds were normal and there was mild tenderness in right hypochondrium. His initial X-ray chest showed gas under the right hemidiaphragm and a slightly elevated right hemidiaphragm also (fig. 1-A). Considering it a case of pnemoperitoneum. X-ray abdomen, Right decubitus view was done (fig. 1-B) which showed no free air rising in superior position thus excluding pneumoperitoneum. Since patient was not toxic the gas under right hemidiaphragm was thought to be present in transverse colon (Chilaiditi syndrome) in which transverse colon passes between the liver and rt hemi-diaphragm. The patients barium enema was performed which revealed normal location of the transverse colon in sub-hepatic location (fig. 2-A). Urine RE was normal .Blood complete picture revealed total leukocyte count (TLC) of 8.3x109/L. His Differential leukocyte count revealed neutrophil count of 77%, lymphocyte count of 16%, monocytes 4% and eosinophils 3%. No malarial parasites were seen on blood smear and his blood sugar (random) was 5.0mmmol/L. Repeat X-ray chest 4 days later revealed air-fluid level under rt hemidiaphragm (fig. 2-B). Abdominal ultrasound revealed a complex abscess in the rt sub-phrenic area with air in it. The abscess measured 7x12 cm and was compressing the liver parenchyma. No ascites was seen. Rest of the ultrasound of abdomen revealed no pathology .To see the complete extent of abscess, a CT scan of the abdomen was advised. It revealed presence of sub-phrenic abscess in rt anterolateral position compressing the rt lobe of liver medially and inferiorly. Air –fluid level was also seen in the abscess confirming infection by gas forming organisms (fig. 3). Minimal pleural effusion was also seen .Rest of the abdominal study

Correspondence: Maj Muhammad Umar Amin, Classified Radiologist, Combined Military Hospital, Bahawalpur.

was normal .High dose I/V antibiotics including Inj cefoparazone, Inj metronidazole and Inj gentamycin. He was referred to surgeon who planed exploratory laparotomy of the patient. Approximately 150ml of foul smelling greenish pus was drained from the abscess cavity and sample sent for culture and sensitivity. A drain was placed in the Morrison's pouch and abdomen was closed. Post operatively, I/V antibiotics were continued. Pus culture revealed the growth of staphylococcus aureus, enterococci and gram negative rods. Based on pathologist's report, Inj tazocine (pipracilin/tazobactum) was added to the patient's antimicrobial therapy. Patient was discharged symptom free ten days later.

DISCUSSION

Idiopathic subphrenic abscesses are rare as was our case. Since no surgical intervention was done previously, possibility of subphrenic abscess was not considered initially and his initial investigations were done for pneumoperitoneum and Chilaiditi syndrome which are relatively common intra-abdominal conditions. Chilaiditi syndrome is interposition of the intestine between liver and diaphragm. It is often asymptomatic but we have seen its cases presented as acute pain in the abdomen, mistaken renal colic, suspected subphrenic abscess and pnemoperitoneum. The colonic interposition may sometimes progress from mild abdominal discomfort to intermittent bowel obstruction [5]. That was the reason of performing barium enema in our patient.

Chest x ray of the patient who has post operative pyrexia often provides vital clue to the presence of a subphrenic abscess. Over 80 % of subphrenic abscesses will show a raised hemidiaphragm, 70% show evidence of basal consolidation and 60% will have a pleural effusion. Gas under the diaphragm is seen rarely in cases of subphrenic abscess, that also when gas forming bacteria are present [6].

The peritoneum may be contaminated during or after surgery, from such events as anastomotic leaks. Some subphrenic abscesses

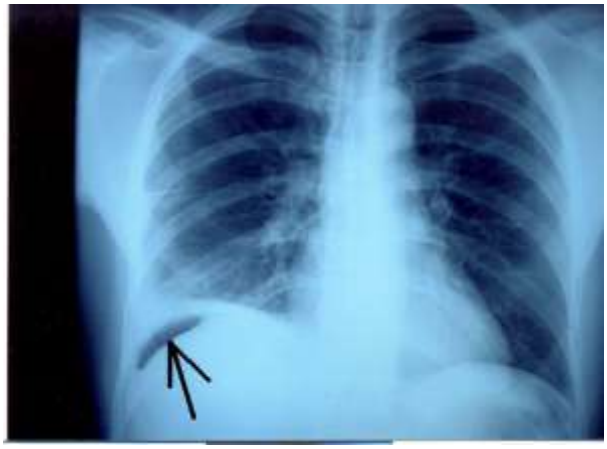

Fig. 1-A: Frontal radiograph shows gas under right hemidiaphragm (arrow), as well as elevation of the right hemidiaphragm and blunt right costophrenic angle.

Fig. 1-B: X-ray abdomen, Right decubitus view No pnemoperitoneum seen.

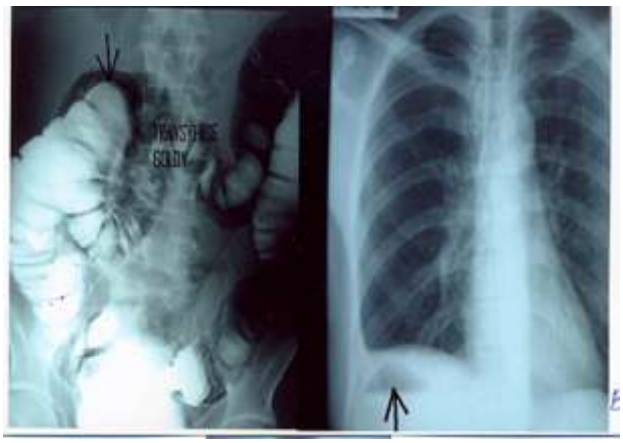

Fig. 2-A: Ultrasound: Air containing abscess is depicted in the right subphrenic region (arrow = Diaphragm).
Fig. 2-B: X-ray showing sub-phrenic abscess with air-fluid level (arrow).

follow spread of infection through the peritoneal cavity from a distant site of contamination (e.g. appendicitis). Factors favoring movement of fluid into subphrenic spaces include the negative pressure in the area generated during the diaphragmatic movement of respiration and greater intra-abdominal pressure in the lower abdomen [7]. Clinical manifestations of subphrenic abscess usually begin subtly within 3 to 6 wk after surgery but occasionally do not appear for several months. Fever, nearly always present, may be the only evidence, although anorexia and weight loss are common. The most common abdominal complaint, pain, is often accompanied by localized tenderness. A mass, wound drainage or sinus tracts at the previous abdominal incision site are sometimes present. Abdominal distention and hypoactive bowel sounds from paralytic ileus are common. Leukocytosis occurs in most patients, and anemia is common. Results of blood cultures are occasionally positive. Chest x-rays are usually abnormal. The common findings are ipsilateral pleural effusion, elevated or immobile hemidiaphragm, lower lobe infiltrates, and atelectasis. Plain abdominal films may reveal extraintestinal gas in the abscess, displacement of adjacent organs, or a soft tissue density representing the abscess.

Ultrasound is helpful in right-sided subphrenic abscesses. The left-sided subphrenic area is more difficult to examine because of the gas-filled stomach, splenic flexure, aerated lung, and ribs. Moreover, because the spleen varies in shape and size and may contain few echoes, it can resemble an abscess. Although most intra-abdominal abscesses can be detected by CT, ascertaining whether an abnormality lies just above or below the diaphragm may be difficult. CT is helpful when the left upper quadrant is the likely site of infection or during the postoperative period, when wounds, dressings, and drains make ultrasound difficult [8]. Intra-abdominal complications include incisional breakdown and fistula formation. Occasionally, an abscess

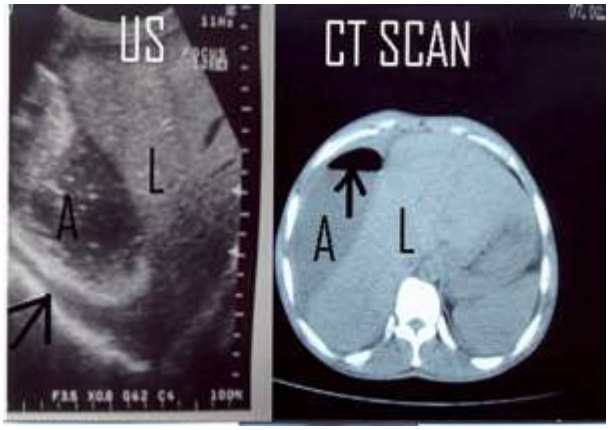

Fig. 3: [A] Ultrasound (US). [B] CT scan. L=Liver, A=Abscess.

compresses the inferior vena cava, causing lower extremity edema. Treatment is with surgical or percutaneous catheter drainage. Antibiotics are adjuncts but not satisfactory substitutes. Adequate nutrition is critical during the often prolonged hospital course [9].

CONCLUSION

Idiopathic subphrenic abscess should always be remembered in cases of pyrexia of un-known origin and especially if gas under right hemidiaphragm is also seen on x-ray chest. Serial ultrasound scans performed every day in such suspected cases may detect it as a small sub-phrenic abscess may be missed on initial scan.

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