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Large Retroperitoneal Abscess Presenting As Acute Abdomen with Extensive Subcutaneous Emphysema Due To Gas Forming E.Coli Infection- A Case Report

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Abstract
Background: *Retroperitoneum is a substantial space with ill defined boundaries. Retroperitoneal abscess is a condition with uncommon etiological factors like retrocaecal appendicitis, psoas abscess, contained duodenal ulcer perforation, pyelonephritis and iatrogenic causes.[1] The presenting symptoms and signs of retroperitoneal abscess are vague and non specific and thus a careful history taking, abdomen examination and imaging studies are all essential to arrive at the diagnosis. Since the morbidity and mortality rates of this condition are high, early attention to patients presenting with non specific abdomen pain and distension, appropriate management with antibiotics, surgical/ non surgical drainage , treatment of underlying etiological condition, treatment of co-morbid conditions will help in successfully saving the patient from this rather under diagnosed condition.*
Case Report: *A 75 years old male patient, with no known co-morbid conditions, non smoker, with previous history of ERCP done 5 years back for CBD stone, presented to our ER with acute abdominal pain. He had symptoms of abdomen pain and distension for past 1 month, which increased in severity over the past 4 days. On receiving, patient's general condition was poor with unstable vitals. Patient was resuscitated and stabilised. Abdomen examination showed presence of diffuse distension and tenderness, guarding more pronounced on the right side with absent bowel sounds. Lab studies revealed an elevated total count and CRP and low Hb. Imaging studies showed huge retroperitoneal cyst with abscess, with presence of pneumoperitoneum, pneumo retroperitoneum, pneumomediastinum, and subcutaneous emphysema of right side of abdomen and scrotum. Patient was taken up for emergency exploratory laparotomy, and drainage of abscess and cyst wall excision was done. Even with administration of higher iv broad spectrum antibiotics, mechanical ventilation, ionotropic support and best supportive care, patient deceased on POD-1 due to sepsis and advanced disease progression. Culture of blood and pus specimen grew Escherchia coli species*
Discussion*: Emphysematous infections of the abdomen and pelvis are potentially life-threatening conditions which require aggressive medical , more often immediate surgical management. The initial clinical presentation of such conditions may be insidious, but there will be usually rapid progression of the disease due to sepsis and mortality rates are high. Retroperitoneal emphysematous abscesses are even rarer conditions and are due to gas forming organisms, most common being E.coli infections.[2] Medical management is done by administering broad spectrum higher iv antibiotics along with percutaneous drainage of abscess and then specific antibiotic administration according to culture and sensitivity. Surgery is indicated when there is multilocuated collection, failure of percutaneous drainage of abscess, psoas abscess, abscess dissecting along fascial planes.*
Key Words: *Retroperitoneal abscess, Penumoperitoneum, E.Coli, Acute abdomen*

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I. Introduction

Retroperitoneum can be defined as the space between the posterior peritoneal envelopment and posterior body wall. The boundaries of the retroperitoneal space are – the diaphragm superiorly, posteriorly the spinal column and iliopsoas muscles, inferiorly the levator ani muscles. The anterior border of the retroperitoneum is convoluted, which extends into the spaces in between the mesentery of the small and large bowel. Retroperitoneal abscess is an uncommon condition which has unusual and insidious presentation. The etiological factors contributing to the formation of retroperitoneal abscess are retrocaecal appendicitis, contained duodenal ulcer perforation, psoas abscess, IBD, pyelonephritis, iatrogenic perforation associated with OGD

scopy or ERCP, and as a complication of acute pancreatitis. The causative organisms are usually E.coli, Proteus species, Staphylococcus aureus, Mycobacterium tuberculosis and other anaerobes. Immunocompromised conditions like diabetes mellitus, steroid intake, malignancy all pose increased risk for the development for retroperitoneal abscess. The substantial nature of retroperitoneum and its ill defined boundaries and also the rare etiological factors contributing to its occurrence makes retroperitoneal abscess a rather under diagnosed condition which leads to a high mortality rate of about 25% [3]. Thus patients presenting with chronic non specific abdomen pain and abdomen distension should be evaluated carefully for retroperitoneal conditions also, and CT scan of the abdomen and pelvis remains to be a valuable imaging study to confirm the diagnosis. Here we present an interesting case of retroperitoneal cyst with abscess presenting as an acute abdomen, associated with pneumoperitoneum, pneumomediastinum, pneumo retroperitoneum, and extensive subcutaneous emphysema of the right side of abdomen and thigh due to infection by gas forming E.coli organism.

II. Case History

A 75 years old male patient presented to the emergency room with history of severe abdomen pain for past 4 days. There were episodes of on and off abdomen pain in the past 2 months, which settled on taking analgesic medications. The abdomen pain was diffuse, more on the right side. The patient had progressively increasing abdomen distension in the past 2 months which had no aggravating or relieving factors. The patient had fever history for 4 days, which was on and off and associated with chills and rigors. Patient also had complaints of breathlessness for past 2 days. There was no history of burning micturition, trauma to abdomen, hematuria, jaundice, vomiting or alteration in bowel habits. There was no significant weight loss. Patient did not have any co-morbid conditions like diabetes mellitus, systemic hypertension, renal failure or cardiac disease. Patient was not on any chronic medication. Patient had history of ERCP and CBD stenting done 5 years back for choledocholithiasis, stent removal was done 6 weeks after the surgery. Patient was asymptomatic after the surgery till 2 months back. He was non smoker and occasional alcoholic. On receiving in the ER, the patient’s general condition was poor and vitals were unstable. The patient was dyspneic, tachypneic, with cold extremities and thready pulse. Patient was attended, resuscitated from shock and stabilized with fluids started on ionotropic medicatons, broad spectrum antibiotics and other supportive measures. The patient was morbidly obese. Abdominal examination revealed, distension which was more pronounced on right side, diffuse tenderness was present, with guarding – more on right side and no rigidity. There was subcutaneous emphysema along the right abdomen wall and right upper thigh. Bowel sounds were not heard, per rectal examination did not reveal any significant findings. Examination of external genitalia showed non tender soft swelling of right scrotum with crepitus. Systemic examination was done, CVS- both heart sounds heard, RS- B/L air entry present, no added sounds.

Laboratory investigations showed- elevated WBC (21,000/mm^3), low Hb (9.7 g%), elevated CRP (72 mg/dl), platelet count was 1,38,000/mm^3. RBS, RFT, LFT and lipid profile were within normal limits. Patient’s nasopharyngeal swab was tested negative for COVID-19. After stabilisation, imaging studies were done.

USG abdomen- showed presence of moderate free fluid in abdomen and pelvis with sluggish bowel peristalsis.

CECT abdomen and pelvis showed large retroperitoneal collection along right lumbar and paracolic gutter measuring about 17.9* 20.4* 12.2 cm (CC*AP*TR) and presence of pneumoperitoneum and pneumoretroperitoneum. Multiple airpockets were noted along the perihepatic, right paracolic gutter, right psoas muscle, RIF region extending upto inguinal canal upto right scrotum. Bowel loops were displaced to the left and anteriorly. Right kidney was not visualized separately. Minimal free fluid in pelvis found

FIG 1: RETROPERITONEAL ABSCESS, ABDOMEN WALL EMPHYSEMA

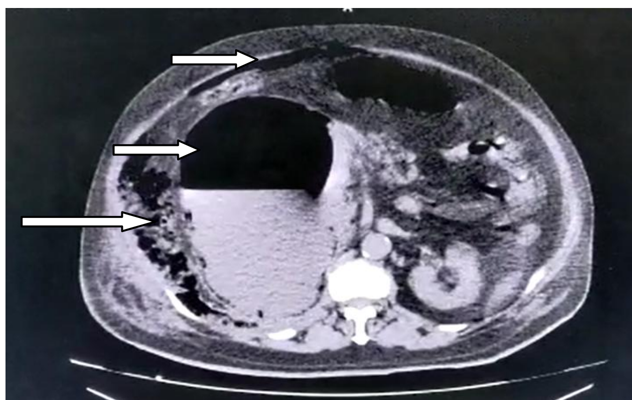
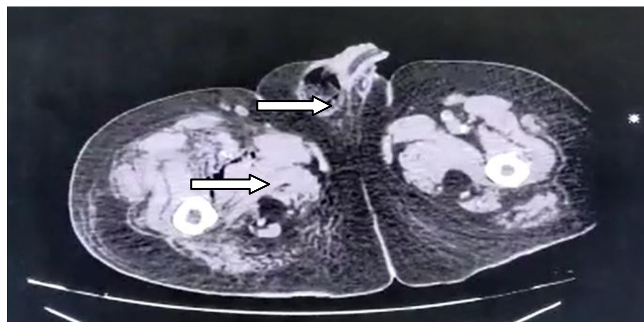
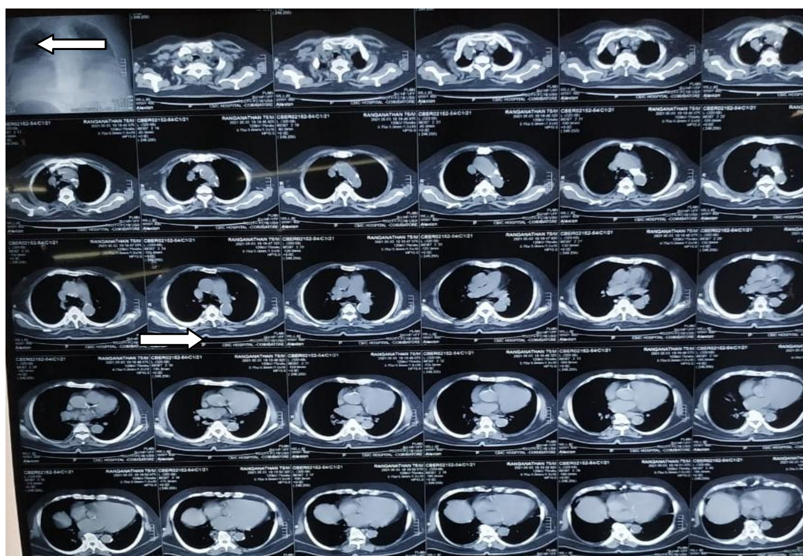


FIG 2: RIGHT SCROTAL AND RIGHT THIGH EMPHYSEMA



CT Chest showed pneumomediastinum and cardiomegaly with right minimal pleural effusion. (FIG 3)



Patient was taken up for emergency exploratory laparotomy after explaining the risks. Peritoneal cavity was entered, and bowel found to be distended, but viable. Small bowel loops were pushed to the left side. Retroperitoneum was entered, large cyst of size about about 20 * 20 * 10 cm (CC*AP*TR) was found. About 2 litres of pus was drained, cyst cavity wall excised, unhealthy abdomen wall tissue was excised, thorough wash was given and abdomen was closed after placing drains.

FIG 4. INTRA-OP PICTURE SHOWING RETROPERITONEAL CYST

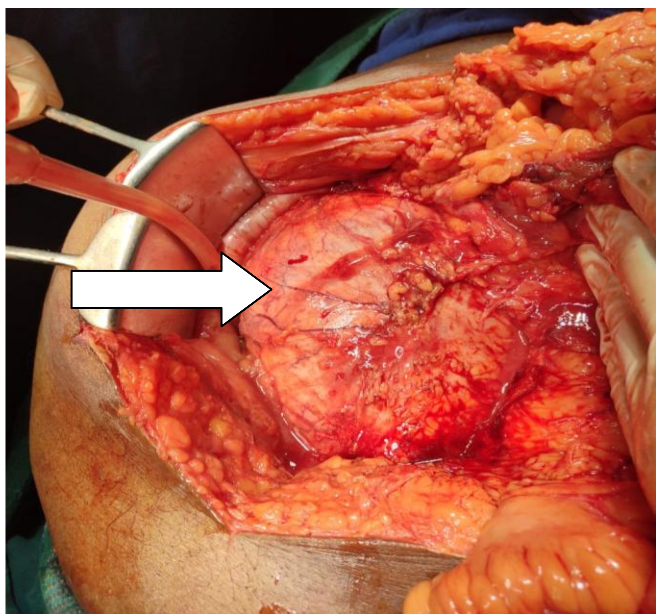
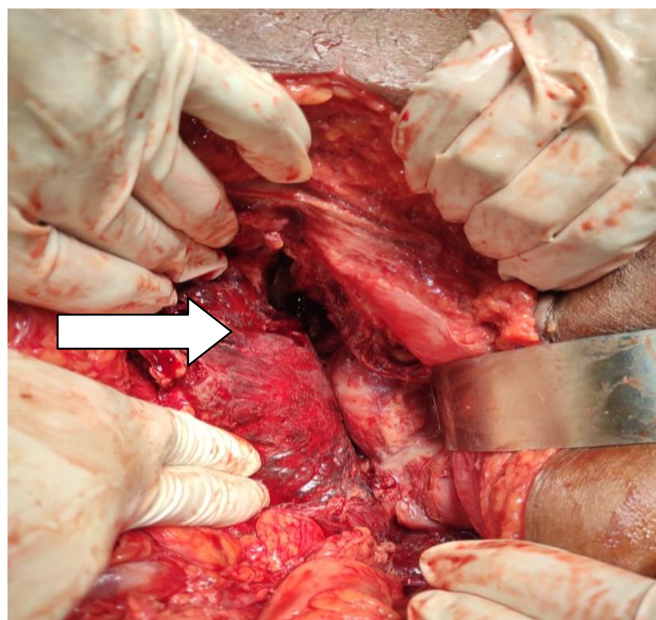


FIG 5. INTRA-OP PICTURE SHOWING CYST WALL AFTER DRAINING PUS



Post operatively, patient was not extubated, was kept on mechanical ventilation and ionotropic support. Patient was treated with higher broad spectrum antibiotics. Inspite of SICU care and close post operative monitoring, Patient succumbed to poor general condition and sepsis on POD-1. Pus and blood specimens were sent for C/S which grew Escherchia coli species. Urine culture did not grow any organism. HPE of the cyst wall showed fibrofatty and granulation tissue.

III. Discussion

Retroperitoneal abscess is a rather uncommon condition, which has insidious onset, and protracted and prolonged period of illness. Retroperitoneal abscess can be divided into 5 types based on the location of the abscess in the retroperitoneal space- [5]

1) Perinephric abscess
2) Pelvic abscess
3) Upper retroperitoneal abscess

4) Combined retroperitoneal and pelvic abscess
5) Localised musculoskeletal abscess

Retroperitoneal abscess is usually due to multi bacterial infection. Some of the organisms responsible for the causation of retroperitoneal abscess and possible primary sites of source of the abscess are as follows:

- E. coli (urinary tract)- Renal infections are the most common cause for retroperitoneal abscess. Diabetic patients and patients with urinary tract obstruction have a higher incidence of emphysematous pyelonephritis, which may in time progress to emphysematous retroperitoneal abscess.
- Proteus species (urinary tract)
- Klebsiella pneumonia species
- Multi bacterial causation and anaerobic organisms (GIT) - second common cause . GI conditions which may lead to this condition are perforated duodenal ulcer, perforated appendix, colon cancer with perforation, diverticulitis, IBD- Crohn's disease
- Staphylococcus aureus (septic focus at a distant site in the body)
- Mycobacterium tuberculosis (Pott's disease)
- It may also be due to iatrogenic causes such as after invasive procedures like ERCP or OGD scopy, or other abdomen and pelvic surgeries.
- Retroperitoneal trauma
- Pancreatitis

Emphysematous infections of the abdomen and pelvis are potentially life-threatening conditions which require aggressive medical, more often immediate surgical management. The initial clinical presentation of such conditions may be insidious, but there will be usually rapid progression of the disease due to sepsis and mortality rates are high. Retroperitoneal emphysematous abscesses are even rarer conditions and are due to gas forming organisms. In our case, the causative organism was E.coli, which is a gas forming organism.

Any immunocompromised state acts as a risk factor for the development of retroperitoneal abscess. Some of the risk factors are:

- Diabetes Mellitus
- Chronic alcohol consumption
- Cirrhosis of liver
- Malignancies
- Steroids administration
- Chronic kidney disease

In our case the patient was not diabetic or CKD, and had no history of malignancy.

The presenting symptoms of retroperitoneal abscess are usually vague and non specific in nature, such as abdomen pain, vomiting, altered bowel habits, fever, chills, rigors, lethargy and loss of weight. [4] Patients may also present with extra-abdominal symptoms like referred pain to the hip or knee or painful inguinal/scrotal swelling. The spread of retroperitoneal abscesses to the thigh is due to the anatomy of the retroperitoneum. Our patient presented with history of abdomen pain and distension for a long duration.

Laboratory investigations are not diagnostic but may reveal leucocytosis, elevated CRP and ESR levels. CT scan of the abdomen and pelvis can be taken as diagnostic and valuable investigation in the evaluation of a patient suspected of having retroperitoneal abscess. Complications of retroperitoneal abscess formation usually are due to septicemia which occurs late in the disease progression. Some of the complications are pneumonia, respiratory failure (most common), recurrence of abscess after drainage, DVT/ arterial thrombosis, acute renal failure, intestinal obstruction, cerebral abscess and osteomyelitis. [6] Our patient presented to the hospital with septicaemia and respiratory distress.

As this is a condition with high mortality rate, only early identification of the condition along with appropriate medical and surgical management will save the patient. Medical management is done by administering broad spectrum higher iv antibiotics along with percutaneous drainage of abscess and then specific antibiotic administration according to culture and sensitivity. [7] Surgery is indicated when there is multiloculated collection, failure of percutaneous drainage of abscess, psoas abscess, abscess dissecting along fascial planes. Our patient, inspite of undergoing surgical removal of the abscess cavity and appropriate medical management, did not improve and died due to late presentation of the disease.

IV. Conclusion

Retroperitoneal abscess, being a rare condition with insidious course of non specific symptoms, with usually late presentation of the patient to the healthcare system, remains a disease with high mortality rate. Retroperitoneal emphysematous abscess is even rarer condition and is highly fatal. Thus attention to the vague

symptoms of the patients in the OPD and evaluation in suspected patients keeping in mind as a differential if all other common conditions are ruled out, appropriate and timely medical / surgical management may aid in the successful treatment of this life threatening condition**.**

CONFLICTS OF INTEREST
There are no conflicts of interest

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