

**Case report****Perforated Subhepatic Appendix Presenting as a Gas under Diaphragm: Clinical Diagnostic Challenges for Surgical Residents- A Case Report****Dipak Kumar Yadav<sup>\*1</sup>, Bhesraj Gautam<sup>1</sup>, Amit Bhattarai<sup>1</sup>, Saurav Poudel<sup>1</sup>, Ashish Bhattarai<sup>2</sup>**<sup>1</sup>Department of General and Laparoscopic Surgery, Nobel Medical College Teaching Hospital, Biratnagar, Nepal, <sup>2</sup>Department of Radiodiagnosis, Nobel Medical College Teaching Hospital, Biratnagar, NepalArticle Received: 30<sup>th</sup> November, 2023; Accepted: 25<sup>th</sup> December, 2023; Published: 31<sup>st</sup> December, 2023DOI: <https://doi.org/10.3126/jonmc.v12i2.61522>**Abstract**


This study addresses the rarity of the subhepatic location of the appendix, found in only 0.08% of cases, and the infrequent occurrence of perforated appendicitis presenting with gas under the diaphragm. When these two uncommon conditions present in a single patient with acute appendicitis, it often poses a diagnostic challenge for surgical residents in training. The following case involves a patient with generalized abdominal pain and a soft abdomen. Her chest x-ray findings indicated free gas under the right hemi-dome of the diaphragm and an inconclusive ultrasound for acute appendicitis, computed tomography confirmed the subhepatic appendix and pneumoperitoneum. Her chest x-ray showed free gas under the right hemi-dome of the diaphragm while the ultrasonography of the abdomen was inconclusive of acute appendicitis. On computed tomography scan of the abdomen, pneumoperitoneum was confirmed and a sub-hepatically placed appendix was noted. During the operation, a sub-hepatically placed and perforated appendix was noted. Post-operatively, the patient had an uneventful recovery and was discharged on the 4th postoperative day. Perforated subhepatic appendicitis presenting with gas under the diaphragm is very rare. Its atypical presentation makes it challenging for surgical residents as well as surgeons to make a timely diagnosis

**Keywords:** *Acute appendicitis, Case report, Pneumoperitoneum***Introduction**

Subhepatic location of the appendix is found only in 0.08% which is a rare location as well as perforated appendicitis presenting with gas under the diaphragm [1, 2]. Case reports of such kind will caution the residents on duty to be aware of such scenarios and include them in the differentials of such unusual presentations. This case report has been reported in line with the Surgical Case Report (SCARE) Criteria [3].

**Case Report**

A 52-year-old female presented to the emergency department with a complaint of generalized abdominal pain for 3 days which progressed in intensity. She also had a raised body temperature since the second day of illness. The pain was associated with two episodes of non-bilious vomiting. She also complained of loss of appetite. She had no significant past medical and surgical history.

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On our assessment, she had raised body temperature (100.4°F), tachycardia, and blood pressure within the normal range. Pallor, icterus, dehydration, and edema were not present. Abdominal examination revealed tenderness over all quadrants more on the right upper quadrant. Rebound tenderness was not present. The patient initially sought treatment at a local health post, where a diagnosis of gastroenteritis was made. Subsequently, the patient received intravenous Ceftriaxone and Metronidazole. Regrettably, her symptoms did not abate with the initial treatment, necessitating further intervention and prompting her referral to our center for continued and more specialized management. Her total white blood count was 10,400/cumm. The appendix was not visualized in her ultrasonography of the abdomen and pelvis. Her chest x-ray showed free gas under the right hemi-dome of the diaphragm (Figure 1).

Contrast-enhanced CT abdomen and pelvis was performed, and it showed pneumoperitoneum and subhepatic appendix as shown in figure 2.

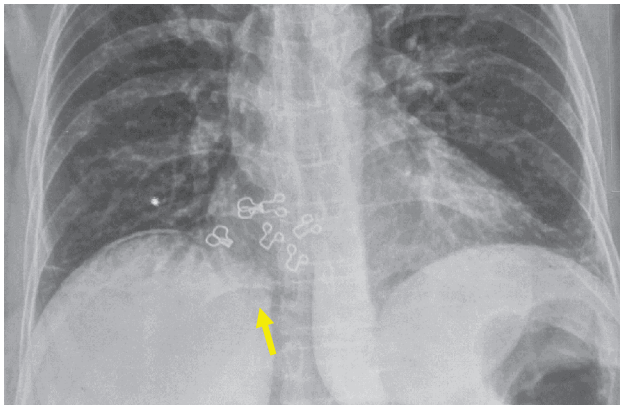


Figure 1: Free gas under right dome of diaphragm



Figure 3: Appendix localization in transverse view



Figure 4: Base of appendix

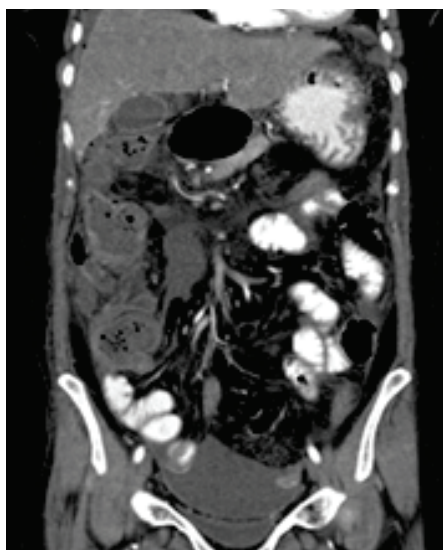


Figure 2: Appendix localization

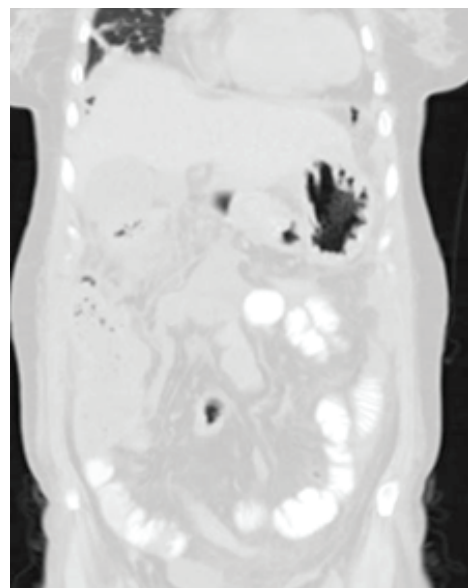


Figure 5: Pneumoperitoneum

With the provisional diagnosis of hollow viscus perforation, the patient underwent laparotomy. On opening the peritoneum, around 100 ml pus was aspirated from the right paracolic gutter, and reactive fluid was also aspirated from the subhepatic area. The appendix was subhepatic in location. The appendix was perforated at the shaft and fecolith was found (figure 6). The base of the appendix was healthy. An appendectomy was done and the right pelvic drain was placed.



**Figure 6:** Aspirated pus from the right paracolic gutter (left), perforated appendix (right)

Patient was kept on intravenous antibiotics piperacillin-tazobactam. Drain was removed on 3<sup>rd</sup> day of operation. Pus culture of the abscess yielded a growth of *E. coli* with sensitivity to piperacillin-tazobactam, gentamicin, and amikacin. The patient was discharged on the 4<sup>th</sup> postoperative day. On a 2-week follow-up, the patient didn't have any new complaints and she resumed her daily activities.

### Discussion

The most common surgical condition that presents to the emergency department is acute appendicitis [4]. The diagnosis of acute appendicitis in half of the cases remains a challenge for most surgeons under training as those half present with atypical features [4]. A clinical scoring system was developed to reduce the rate of negative appendectomy. The most popular scoring system is the Alvarado score which has been modified later [5]. In hospitals with residents in training, cases will be first assessed by the residents. The case is then discussed with the on-

duty consultant and then planned for management. Residents remain supervised throughout the time. In the case of acute appendicitis, modified Alvarado score plays a vital role in assisting residents in diagnosing the case of acute appendicitis but it is not always correct. In the past, around 10% to 20% negative appendectomy rate has been accepted to minimize the incidence of perforated appendicitis. However, due to enhanced radiological imaging, this rate has been reduced significantly [6].

Acquiring the skill to perform an appendectomy is a crucial milestone for surgical residents. Various studies have shown that surgical residents may safely do appendectomies both by open and laparoscopic methods without the presence of a senior general surgeon [7–10]. It has been found that surgeons are more skilled in performing abdominal examinations [11]. The experience of the surgeon is of utmost need in such a common case with a rare presentation. Surgical residents will have diagnostic challenges in cases like this.

### Conclusion

Perforated subhepatic appendicitis presenting with gas under the diaphragm is very rare. Its atypical presentation makes it challenging for surgical residents as well as surgeons to make a timely diagnosis. These cases will alert the residents on duty to be mindful of such scenarios, prompting them to include these unusual presentations in their list of potential differential diagnoses.

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