

A RARE CASE OF PNEUMOPERITONEUM DUE TO PERFORATION AT TIP OF APPENDIX

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ABSTRACT:

Pneumoperitoneum caused by a perforated appendix is extremely rare. We encountered a case of a 24 years old male presented in the emergency department of EAST surgical ward of MAYO Hospital Lahore with a history of epigastric pain for 10 days, which later became generalized. Chest X-ray showed free air under the right hemidiaphragm. On the basis of clinical examination and radiological correlations diagnosis of duodenal ulcer perforation was made. On exploration of abdomen through midline incision it was found to be a perforated appendix at its tip. The body and base of the appendix was normal. No per operative and postoperative complications were encountered and the patient discharged on the second postoperative day. Biopsy of appendix showed acute inflammation of appendix.

KEYWORDS: Perforation, Appendix, Pneumoperitoneu

How to cite this Case Report:

Ammar AS, Hadi A, Anwar U, Inayat F, Batool S, Naqi SA. A Rare Case of Pneumoperitoneum due to Perforation at Tip of Appendix. J Gandhara Med Dent Sci. 2022;9(2): 75-77

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INTRODUCTION:

The term pneumoperitoneum is defined as the presence of free air inside the peritoneal cavity. The cause of this free air inside the peritoneal cavity is mostly the perforation of any hollow viscus while other causes include the production of free air inside the peritoneal cavity by gas forming microorganisms like clostridium¹. This free air in the abdomen is demonstrated by radiological finding of erect chest X-ray that shows free gas under the right hemidiaphragm. The most common causes of free gas under the diaphragm are perforated duodenal and gastric ulcer followed by small intestine perforations and lastly large

intestine perforation². Free gas under the diaphragm after a perforated appendix is found to be very rare. This is due to the fact that lumen of the appendix is very small and only a small amount of air, less than 2 ml, is present in the appendix which is very insignificant to produce the radiological finding of free gas under the diaphragm³. This mostly depends on the location of perforation in the appendix as perforation near the base of appendix has high chances to cause pneumoperitoneum because of air coming from cecum. However, the chances to produce free air under the diaphragm are extremely rare if the perforation occurred near the tip of the appendix. There are very limited number of case reports present in the literature where free air under the diaphragm has been documented after perforated appendix⁴. In this case report we are going to describe a case of perforated appendix at its tip, which was initially diagnosed as a case of duodenal ulcer perforation due to presence of sign and symptoms and free air under the right hemidiaphragm.

CASE REPORT:

A 24-year-old male presented in the emergency department of EAST Surgical Ward of Mayo hospital Lahore in May 2021 with chief complaints of epigastric pain for 10 days and vomiting for 2

days. Pain was gradual in onset and moderate in intensity starting from the epigastric region and later became generalized. He was taking pain and steroid medications for many months off and on from a local doctor for his epigastric pain. His previous medical and surgical history was unremarkable. On physical examination his pulse was 110 beats per minute, blood pressure of 120/80 mmHg and temperature of 100-degree Fahrenheit. Mild tenderness was present over the whole abdomen but rebound tenderness was more marked in the right iliac fossa. Bowel sounds were absent and digital rectal examination was unremarkable. His total leucocyte count was $15.9/\text{mm}^3$ and Chest X-ray showed free gas under right hemidiaphragm and abdominal X-ray erect showed ground glass appearance (Figure 1). On the basis of clinical examination diagnosis of duodenal ulcer perforation was made and exploratory laparotomy was planned under general anesthesia after written and informed consent from the patient. On opening the abdomen from midline umbilical saving incision, 500 ml of purulent fluid was noted in the abdomen cavity. The stomach and duodenum surface were normal with no signs of perforation. On gross inspection of the abdomen, the appendix was found perforated at the tip in the right iliac fossa (Figure 2). The body and base of the appendix was normal. Appendix base was ligated, drain placed in the right iliac fossa and the abdomen closed. Removed appendix was sent for histopathology. Patient was kept in the ward for 2 days under observation and then after removing the drain and allowing him oral diet he was discharged from the ward. Later a biopsy of the appendix was followed and it showed signs and symptoms of acute appendicitis.



Figure 1: Chest X-Ray Showing Free Gas under Right Diaphragm (Blue Arrow)



Figure 2: Appendix Sample Showing Perforation at the Tip of Appendix (Black Arrow) and Normal Body and Base (Blue Arrow)

DISCUSSION:

The incidence of pneumoperitoneum in cases of perforated appendix is found about 0 to 4.1% only with majority of the cases were adults and very few of them were children⁵. Very little literature is available which shows that the cause of pneumoperitoneum is perforated appendix. In a case report published by Mashayekhi et al, it was shown that the perforation of the appendix was near its base which gives the impression that the free air came out from cecum⁶. But in our case the perforation was near the tip of the appendix. One possible reason for this free air in the peritoneum is the presence of fecalith in the lumen of appendix which trapped the air between tip and once the appendix become perforated this closed cavity between fecalith and tip of appendix become free in the peritoneum⁷. According to Rehmana et al, among cases of pneumoperitoneum only 8% cases were due to perforated appendix. This shows the relatively small number of cases, which shows pneumoperitoneum as compared to other hollow viscus perforation cases which causes huge pneumoperitoneum. This is probably because of the presence of omentum which quickly reaches to the site of inflamed or perforated appendix and engulfed the area preventing the leaked air from the perforation to cause pneumoperitoneum⁸. In a case report done by Tariq et al, it was shown that younger children present more with perforated appendix because of underdevelopment of omentum and it is difficult to diagnose appendix in young age groups because of the signs and symptoms that resemble any other disease⁹. According to Ueda et al, the role of erect abdominal X-ray has no role in diagnosing perforated appendix except in some cases where fecalith are found as an incidental finding which is

present in about 10 to 20% of the cases¹⁰.

CONCLUSION:

Though very rarely encountered, perforated appendix can cause pneumoperitoneum and surgeons should keep in mind all causes of free gas under the diaphragm before making diagnosis. The signs and symptoms of perforated appendix can mimic any other hollow viscus perforation.

CONFLICT OF INTEREST: None

FUNDING SOURCES: None

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