

Paraumbilical Hernia containing Appendiceal Inflammation: A Systematic Review

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ABSTRACT

Background

Usually umbilical hernia contains bowel loops and omentum. The diagnosis becomes even more challenging when they imitate strangulated umbilical hernia. An acutely inflamed appendix has been seen in the femoral and inguinal hernia but is rarely found in the paraumbilical hernia.

Objectives

To observe the symptoms, findings, and treatment process of cases of umbilical/ paraumbilical hernia in past literature and document a case report in the appendix within the paraumbilical hernia.

Methods

Literature has been searched with keywords and statements of umbilical hernia, appendix within the umbilical hernia, and paraumbilical hernia. Studies on appendix within paraumbilical hernia are scarce in the literature. Six studies from the past 12 years were included.

Results

There were six studies included. Pain, fever, vomiting, and swelling on the umbilicus were the common symptoms. No postoperative complication was seen.

Conclusion

Several factors can be responsible for umbilical hernia. A case report of a 50-years old male presented to Jinnah Hospital, Lahore with pain and umbilical swelling. Appendiceal inflammation was found in the hernia sac. Umbilical herniorrhaphy and appendectomy were done.

Keywords

Umbilical hernia; appendicitis, hernia; appendectomy; herniorrhaphy.

INTRODUCTION:

An abnormal protrusion of an organ or fatty tissue through the wall of the cavity in which it normally resides is known as a hernia.¹ Hernia comes in several types, including groin, hiatus, incisional, and umbilical or paraumbilical².

Umbilical or paraumbilical hernia rarely contains metastatic deposits and vermiform appendix. The usual contents include omentum and bowel loops^{3,4,5,6}. However, doubtful contents become challenging to diagnose particularly when they imitate strangulated umbilical hernia⁷. Appendicitis is the most common reason for hospital emergency surgery. Its incidence is slightly lower in females as compared to males.⁸

Inguinal and femoral hernia refers to appendicitis in the hernia sac⁷. A few cases were reported in

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the literature that highlighted appendicitis within the umbilical hernia. Surgery is the only absolute treatment for appendicitis and strangulated hernia⁹. Appendicitis in the paraumbilical hernia is rarely found in the literature^{7,10,11}. The cause of rareness might be that appendix is rarely found in proximity to the umbilicus.

The symptoms of acute appendicitis are vomiting, anorexia, and center to right iliac fossa abdominal pain in relation to the anatomical space of the appendix from developmental stages⁹. The incidence of appendicitis within a paraumbilical hernia is still unknown⁹. The incidence of umbilical hernia is 23% to 50% in the US population with females at more risk¹². More than 0.5 million emergency operations were performed from 2001 to 2010 in the US¹³.

An umbilical hernia is the faulty median line abdominal wall from 3cm below and above the umbilicus¹⁴. Umbilical hernia can be acquired or congenital and found in adults and children¹⁵. About 10% of all wall hernias are found as umbilical hernias with a prevalence rate is approximately 2% in adults^{16,17}. Several factors such as ascites, obesity, gender, multiple pregnancy, strain while lifting heavy objects and persistent cough can be responsible for umbilical hernia or paraumbilical hernia¹⁸.

Appendicitis in the hernia sac is often assumed an extrinsic compression directed toward partial ischemia¹⁸. CT scan report may be useful in identifying appendicitis in hernia.

Umbilical hernia can develop in children and adults¹⁸. It can become serious over time if not treated. Surgery may be proposed for children or may be suggested to wait for age 3-4 years because surgery isn't necessary as the probability of complications is very low¹⁸. Quite opposed to that, the operation is suggested for adults as the chance of developing complications such as obstruction and strangulation is high¹⁹. Hernia is unexpected to get better among adults by itself. Operation is a way to get rid of and stop major complications. There is also a chance of hernia recurrence after repair¹⁸.

Methodology

Many different statements and keywords such as appendix within umbilical/ paraumbilical hernia were used to collect literature. Studies included the past twelve years. Four studies were taken from the last five years. Geographical regions were not taken into consideration while selecting relevant literature.

The past medical history, symptoms of the disease, findings, postoperative complications (if any), and follow-up after the treatment were given in most of the case studies. These parameters were successfully documented in Table 1. A case study of the appendix within a paraumbilical hernia was also reported.

Case Study

A 50-years old male presented to the emergency of Jinnah Hospital Lahore, Pakistan with a 5-day history of umbilical swelling and increased pain from the past 4 hours. Physical examination revealed pulse 81/min, Bp 140/90 mm/hg, respiratory rate 18/min, and temperature 98.6 F°. Body weight was observed as 100kg. The patient was a smoker. No symptoms such as cough, constipation, fever, nausea, vomiting, and weight loss were found. The patient had a past history of hypertension. Painful and non-reducible paraumbilical; swelling (10x10 cm) with positive cough impulse was noted on abdominal examination.

Ultrasound abdomen and abdominal X-ray were suggested at the initial stage of diagnosis. Strangulated paraumbilical hernia diagnosis was revealed with a (4x4 cm) hernia sac originating from the umbilical containing content of omentum and appendix where omentum content was ischemic. During the surgery sac was opened from the neck and an appendectomy and omentectomy were performed. Simple Mayo's repair was done.

Discussion

The location of the appendix is variable but the most common location is retrocecal. However, its base is found at cecum²⁵. Appendix in hernia sac is linked with the anatomical variations in size, position, mobile or large cecum²⁶. Appendectomy is the standard care of the appendix without perforation²⁵. It is not unusual to find appendicitis in an external hernia i.e., inguinal or femoral hernia. Appendicitis within an umbilical hernia is comparatively rarer than appendicitis within a femoral or inguinal AMYAND hernia²⁰. In other studies, included in the current review, four cases of appendicitis within umbilical hernia are found in the literature^{4,27}, and a case of left-sided Amyand's hernia with obstruction was seen.²⁸

Rayan reported 13% as the prevalence rate of appendicitis within hernia out of total hernia cases^{29,30}. Appendiceal inflammation inside the hernial sac is a condition that is generally an extrinsic compression

Table 1: List of case Studies included in the Review

Author & Year	Age	Gender	Past Medical History	Symptoms	Findings	Post-operative Complications	Follow-up After Treatment
Atabek ²² (2008)	25 days	Male	No	Fever, Vomiting	Bilateral inguinal hernia soft tissue mass within umbilical hernia. Appendicitis within umbilical hernia.	No	No
Agarwal et al. ²⁰ , (2013)	54 years	Female	No	Severe pain, Vomiting	Appendiceal inflammation inside hernia sac, Strangulated paraumbilical hernia,	No	-
Wani et al. ²³ , (2016)	1 year	Female	No	Fever, Vomiting	Appendix has perforated in umbilical hernia in abdominal wall	No	Yes
Kordzade ⁹ (2017)	84 years	Female	Hyperten-sion, Ishemic heart disease, congestive heart failure, hypercholes-terolemia	Abdominal pain, Nausea	Treated successfully for acute appendicitis within paraumbilical hernia	No	6- months follow-up
Zormpa ²⁴ (2019)	30 years	Female	No	Abdominal pain, Vomiting, lump on the umbilicus	Incarcerated paraumbilical hernia.	No	No
Kevin ²¹ (2020)	57 years	Male	No	Pain at hernia, Fever, Nausea, Vomiting, Diarrhea, Constipation, Urinary changes.	Abdomen was soft, obese. Large umbilical hernia, Appendicitis within paraumbilical hernia	No	3-days hospital stay.

heading to partial ischemia¹⁸. The common diagnosis found in literature is strangulated umbilical hernia¹⁹. In the currently reported case study, the strangulated paraumbilical hernia is the usual diagnosis.

Postoperative complications could not be compared due to variations in follow-up time and measurement methods².

Simple suturing of defects, Mayo's repair, or mesh hernioplasty are choices in adults while the area is closed with stitches in children instead¹⁸. The patient may experience discomfort or anxiety while recovering²⁰. There may be several complications of the surgery such as the belly button looks different, rupture or infection of the wound, or may discharge yellow or it may appear as swollen or red¹⁸. Pain can also be a complication²⁰.

CONCLUSION

Past literature has been searched for an appendix within an umbilical/ paraumbilical hernia. Six studies from the past twelve years are included and the patient's age, medical history, symptoms, findings, treatment, postoperative complications, and follow-up has been observed. The major finding were appendix within umbilical/ paraumbilical hernia in observed literature cases and its importance lies in its look, like a strangulated hernia. So, it is concluded that appendicitis within the umbilical hernia has been observed as rare.

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Figure 1: Appendicitis and caecum in an opened hernial sac of the paraumbilical hernia

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