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Original Article

Right Direct Inguinal Hernia in Patients Underwent Open Surgery for Appendicitis – A Retrospective Study

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Abstract

Introduction: Acute appendicitis is the most common surgical emergency faced in today's world. The inguinal hernia is the most common type of hernia seen in surgical practice. It can be of a direct and an indirect type. While the indirect type has a congenital cause, direct hernias are attributable to the weakness of abdominal wall musculature.

Aim: This study aims to study the prevalence of right (direct) inguinal hernia in patients who underwent open surgery for appendicitis.

Materials and Methods: In this retrospective study, 100 patients who underwent surgery for the right direct inguinal hernia were included in the study. Patients' demographic details, history of open appendectomy, and the clinical presentation were collected. The examination consisted of inspection, palpation, percussion, and auscultation and included various tests such as cough impulse and three-finger test. These findings were later confirmed with an ultrasound abdomen examination.

Results: Among these 100 patients, 13 of them had the previous history of open appendectomy, all the study patients were male and they had the right direct inguinal hernia after 5 years of surgery. Among these 13 patients, 10 had perforated appendicitis, 2 had abscess, and 1 had purulent appendicitis. Among these 13, 11 of them had cosmetic Rutherford Morrison or Lanz incision and 2 of them had classical McBurney's incision.

Conclusion: The choice of the incision during open appendectomy is important and the surgeon should avoid injury to the ilioinguinal nerve motor branches which supplies the internal oblique and transverse abdominis muscles, care must be taken during surgery, especially below the horizontal line extending from the anterosuperior iliac spine to the rectus muscle.

Key words: Appendectomy, Appendicitis, Inguinal hernia

INTRODUCTION

Acute appendicitis has been thought of as a sequence of events with an initial enticing event and natural progression, keeping in mind that patients presenting at different points in time present with different clinical pictures. Appendicitis is thought to begin with outflow obstruction of the lumen. Fecaliths (a hard mass of stool also known as appendicoliths when originating in the appendix) has often been cited as a cause for appendicitis and common teaching is to look for a fecalith in the abdominal radiograph; however, there is no clear-cut evidence that this is the case.[1] Fever is a consistent finding but may be absent at the early onset of symptoms. Tachycardia may present because of sympathetic response to abdominal pain; however, persistent tachycardia despite pain control in conjunction with hypotension may be caused by the systemic inflammatory response or sepsis. Abdominal examination reveals tenderness, most often in the right lower quadrant near the iliac fossa; this is known as McBurney's point after Charles McBurney, who

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initially described this clinical finding.[2,3] The exact point of maximal tenderness varies and is affected by the position of the appendix in relation to surrounding structures. Rebound tenderness, elicited either by gentle percussion or rapid release of pressure from the abdomen, indicates inflammatory irritation of the parietal peritoneum.[4] In 1894, Charles McBurney described the oblique right lower quadrant incision and muscle-splitting approach, which continued to be used until the late 20th century (before this, surgeons typically used a midline laparotomy approach). A Rutherford Morrison or Lanz incision is thought to provide a better cosmetic outcome, but the chances of injury to the motor branch of the ilioinguinal nerve are high which resulted in the development of right direct inguinal hernia as a complication.[5] Other common causes are placing a drain through the incision and tying sutures too tightly in the fleshy internal oblique and transverse abdominis muscles, leading to necrosis of the muscle.[6,7]

Aim

This study aims to study the prevalence of right direct inguinal hernia in patients who underwent surgery for open appendectomy.

MATERIALS AND METHODS

In this retrospective study, patients who underwent open appendectomy during the year 2014–2019 were included in the study. Patient's demographic details, history of open appendectomy, and clinical presentations were collected. Baseline investigations such as complete blood count, kidney function test, liver profile, chest and abdominal X-ray, and ultrasonography were done; some of these patients underwent contrast-enhanced CT abdomen and pelvis. The examination consisted of inspection, palpation, percussion, and auscultation and included various tests such as cough impulse and three-finger test. These findings were later confirmed with an ultrasound abdomen examination.

RESULTS

In this study, 100 patients who underwent surgery for the right direct inguinal hernia during the year 2014–2019 were included in the study. There were no female patients in the study group, 100 were male patients. The incidence of open appendectomy induced inguinal hernia in this study group was 13 patients (13%) [Figure 1]. The age of the patients with open appendectomy induced right direct inguinal hernia was more than 36 years. In open appendectomy induced inguinal hernia patients, 10 of them were doing heavy work and 3 of them were doing moderate work [Figure 2]. The open appendectomy induced inguinal hernia patients presented after 5 years of post-appendectomy with signs and symptoms of pain and swelling of the right inguinal region. About 44% of patients had pain, 43% of patients had swelling, and 13% of patients had pain and swelling. In these 13 patients, 10 of them had perforated appendicitis, 2 had abscess, and 1 had purulent appendicitis [Figures 3 and 4]. In these 13 patients, 11 of them had cosmetic Rutherford Morrison or Lanz incision and 2 of them had Classical McBurney's incision [Figure 5]. The patients were treated with the right direct inguinal hernioplasty with no complications during the post-operative period.

DISCUSSION

Appendectomy is one of the most common operative procedures; there have been few reports on the choice of incision in the right lower quadrant of the abdomen. The incision introduced by McBurney in 1894 is the time-honored approach.[5] The efficiency of this incision is well established. The importance of preserving the nerves of the abdominal wall during laparotomy has been realized, and the development of the right inguinal hernia after appendectomy and damage to the segmental nerve supply of the abdominal muscles has been reported.

It was previously reported that a right inguinal hernia may develop after appendectomy. Hoguet in 1911 first described the frequent development of the right inguinal hernia after appendectomy. He found eight right inguinal hernias in 190 patients who had had an appendectomy.[8] In 1951, Lichtenstein and Isoe reviewed 567 patients with inguinal hernia. In 67 of these patients, the appendix had been removed (40 hernias were right sided and 12 bilateral).[9] In a series of 1357 inguinal hernias, Walker found that 110 patients had the previous appendectomy.[10] Gue in 1972 found 41 post-appendectomy patients with

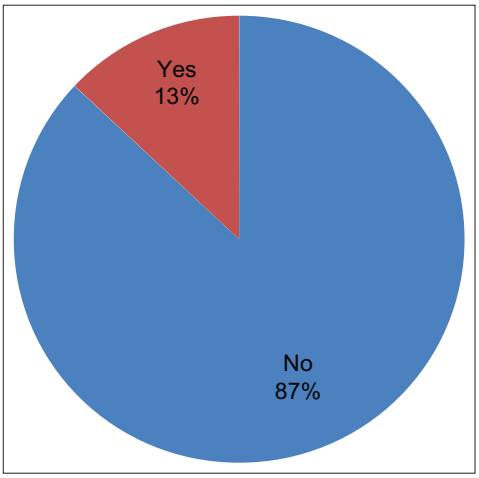

Figure 1: Distribution of incidence of the right direct inguinal hernia in open appendectomy

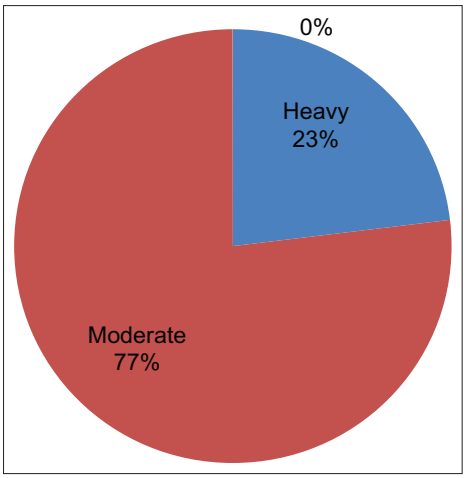

Figure 2: Distribution of the type of occupation

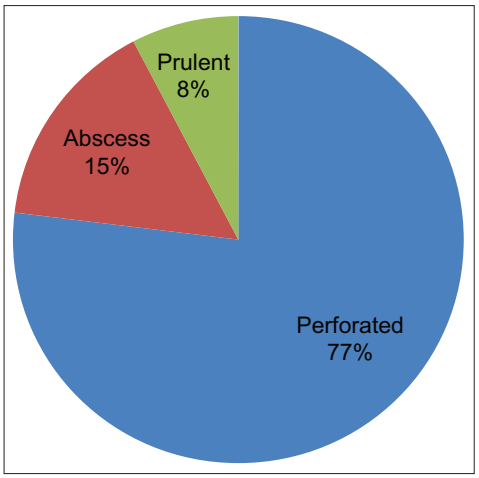

Figure 4: Distribution of the type of appendicitis

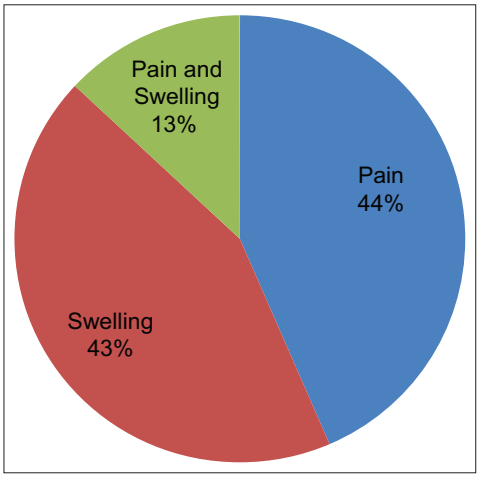

Figure 3: Distribution of signs and symptoms

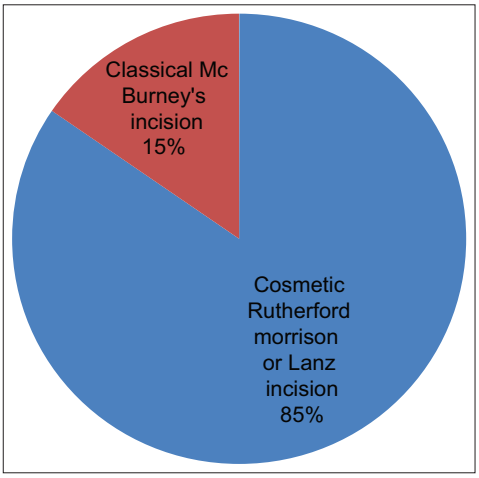

Figure 5: Distribution of surgical incision

the right inguinal hernia among 701 patients with inguinal hernia.[11]

Observations from the present study suggest that appendectomy predisposes to the development of a right-sided inguinal hernia. In spite of the tempting simplicity of etiologic reasoning, a cause-and-effect relationship cannot be confirmed based on these observations. This study emphasizes, however, that nerve injury should be avoided during surgery and also that the structures of the right lower abdominal wall should be preserved. Incisions below the anterior superior iliac spine should be avoided if possible because segmental nerves penetrate at this level. The possibility of herniation might thus be reduced.

CONCLUSION

The incidence of the right direct inguinal hernia is significantly greater in patients who underwent an open appendectomy. The choice of the incision during open appendectomy is important and the surgeon should avoid injury to the ilioinguinal nerve motor branch which supplies the internal oblique and transverse abdominis muscles, care must be taken during surgery, especially below the horizontal line extending from the anterosuperior iliac spine to the rectus muscle because segmental nerves penetrate at this level.

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