



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Chronic inguinal pain after laparoscopic intraperitoneal onlay mesh (IPOM) repair for inguinal hernia treated successfully with laparoscopic selective neurectomy: A case report



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ARTICLE INFO

Article history:

Received 6 July 2017

Accepted 20 July 2017

Available online 25 July 2017

Keywords:

Inguinal hernia

Laparoscopic hernia repair

Intraperitoneal onlay mesh repair

IPOM

Neuropathic pain

Selective neurectomy

ABSTRACT

INTRODUCTION: Laparoscopic intraperitoneal onlay mesh (IPOM) repair is occasionally used for inguinal hernia repair. Here, we report a case of chronic neuropathic pain after laparoscopic IPOM repair for inguinal hernia, which was treated successfully with laparoscopic selective neurectomy.

PRESENTATION OF CASE: A 59-year-old man with bilateral inguinal hernia underwent laparoscopic repair. Transabdominal preperitoneal repair was performed on the left side, whereas IPOM repair was performed on the right side due to a peritoneal defect. At postoperative month 1, he presented with severe pain and numbness distributed from the right inguinal region to the inner thigh region. The symptoms had persisted for 1 year despite medical treatment. We diagnosed that the symptoms might be due to the entrapment of nerves in the contracted mesh, and performed a second surgery via laparoscopic approach 13 months after the first surgery. On laparoscopic exploration, the lateral side of the mesh was contracted and involved nerve branches. We ligated and cut off these nerve branches. His symptoms resolved immediately after the surgery. At postoperative month 12, he has passed without any pain, numbness, and hernia recurrence.

DISCUSSION: Laparoscopic exploration would be useful to figure out chronic neuropathic pain after laparoscopic inguinal hernia repair.

CONCLUSION: Laparoscopic IPOM repair for inguinal hernia should be avoided as much as possible because it may cause chronic neuropathic pain. Laparoscopic selective neurectomy is an option for patients with chronic neuropathic pain after laparoscopic hernia repair.

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1. Introduction

Inguinal hernia repair is one of the most frequent surgical interventions in general surgery. There are several surgical procedures available for inguinal hernia repair. Before the 1980s, tissue repair was usually performed. Currently, tension-free mesh repair

is the standard procedure for patients with inguinal hernia [1–3]. Although the surgical techniques for tension-free mesh repair have evolved in terms of mesh material and approach method, chronic inguinal pain is still a frequent complication after inguinal hernia repair. Laparoscopic hernia repair, such as transabdominal preperitoneal (TAPP) repair and total extraperitoneal (TEP) repair, has been reported to result in less chronic inguinal pain compared with groin incision tissue repair or mesh repair [4–7]. Therefore, the number of patients who undergo laparoscopic hernia repair has been increasing [3,8]. Conversely, when a peritoneal defect, scarring, and/or fibrosis are present at the anterior abdominal wall near an internal inguinal ring, TAPP and TEP repairs are difficult. In such cases, intraperitoneal onlay mesh (IPOM) repair via a laparoscopic approach may be an option [9,10]. Here we report a case of chronic neuropathic pain after laparoscopic IPOM repair for inguinal hernia, which was treated successfully with laparoscopic selective neurectomy. This study is reported in line with the SCARE criteria [11].

Abbreviations: IPOM, intraperitoneal onlay mesh.

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<http://dx.doi.org/10.1016/j.ijscr.2017.07.044>

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2. Presentation of case

A 59-year-old man with bilateral inguinal hernia underwent laparoscopic hernia repair. On laparoscopic exploration, a direct inguinal hernia was observed on the left side, and it was treated by TAPP repair. On the right side, a direct inguinal hernia was observed, but dense adhesions between the cecum and anterior abdominal wall due to previous appendectomy were observed (Fig. 1A). After lysis of adhesions, the peritoneum of the inguinal area was defect (Fig. 1B). Therefore, IPOM repair was performed. After the dissection of the preperitoneal cavity as much as possible, the mesh (Optimized PCO mesh, Covidien Japan Co., Ltd. Tokyo) was fixed to Cooper's ligament, the outer area of the rectus abdominis muscle, and the area beside the inferior epigastric vessels using an absorbable tackler. On the dorsal side, which included the triangle of pain area, the mesh was fixed to connective tissues with several absorbable sutures (Fig. 1C).

The patient's immediate postoperative course was uneventful. He was discharged at postoperative day 3 without any complaints of pain. However, at his postoperative month 1 follow-up, he presented with severe pain and numbness distributed from the right inguinal region to the inner thigh region (Fig. 2). His pain was rated as an 80 on the visual analog scale. He had tenderness with slight palpation and loss of sensation in the area of the numbness. Gait disturbance due to the pain and numbness was also observed. Further, Tinel's sign was positive and the cremaster muscle reflex was preserved. Nonsteroidal anti-inflammatory drugs (NSAIDs) and pregabalin, added as an adjuvant pain medication, were used, but his pain persisted. Ilioinguinal and iliohypogastric nerve blocks were performed twice at 4 and 7 months postoperatively. They had worked for a short time and their effect was limited. Ultimately, his pain had persisted beyond postoperative year 1 despite continuation of medical treatment. Based on these findings, we diagnosed that the symptoms might be due to the entrapment of the ilioinguinal and lateral femoral cutaneous nerves in a contracted mesh, and performed a second laparoscopic surgery 13 months after the original hernia repair.

On laparoscopic exploration, the contracted mesh was found and it involved several nerve branches (Fig. 3A and B). These nerves were ligated proximally and then cut off distally (Fig. 3C). The medial side of the mesh was not wrinkled, and only the lateral part of the mesh was totally contracted. We removed the lateral part of the contracted mesh. The symptoms resolved immediately after this surgery. He was discharged at postoperative day 4. At 12 months after the second surgery, he passed without any pain, numbness, and hernia recurrence.

3. Discussion

The incidence of chronic inguinal pain is reported to be 1%–63% and the rate of debilitating pain affecting normal daily activities or work is 5%–10%¹². Chronic pain is divided into two types: nociceptive and neuropathic pain [12]. Neuropathic pain, caused by intraoperative direct nerve injury, is reported to predominate over nociceptive pain, although it can be difficult to distinguish between these two types of pain [12]. A detailed physical examination and medical interview would be helpful to differentiate neuropathic pain from nociceptive pain [12]. In the present case, the pain was considered to be neuropathic as it improved following nerve block, even if only temporarily. Furthermore, dermatomal mapping showed that the area of numbness was consistent with the dominant area of the ilioinguinal and lateral femoral nerves.

Treatment of patients with chronic neuropathic pain after hernia repair remains challenging. In the International Consensus Conference 2008, the working group recommended conservative

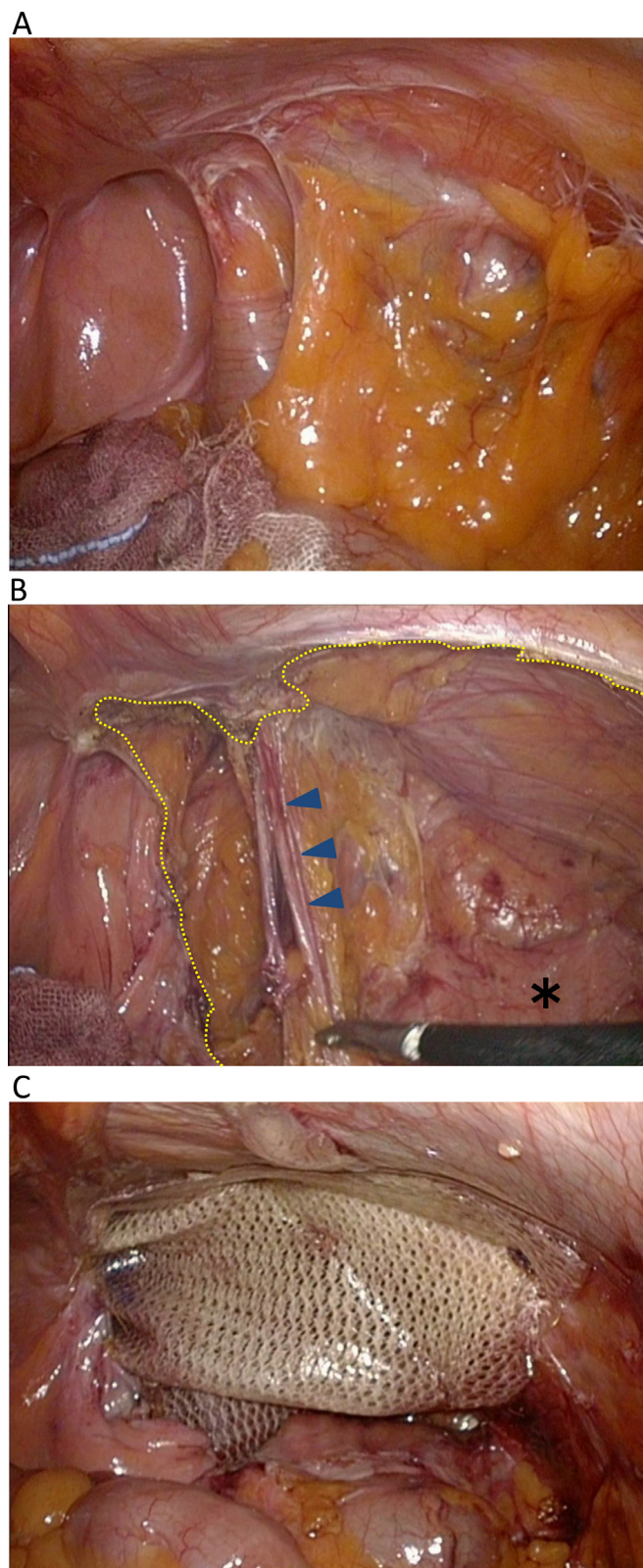


Fig. 1. Laparoscopic findings of the right inguinal region during the first surgery. (A) Dense adhesions between the cecum and anterior abdominal wall were observed. (B) There was a peritoneal defect after the lysis of adhesions. The area enclosed by the yellow dotted line indicates the peritoneal defect. The black asterisk shows the cecum. Blue arrowheads show testicular arteriovenous. (C) Laparoscopic findings after IPOM repair.



Fig. 2. The area of pain and numbness. The area enclosed by the black line indicates the area of pain and numbness.

treatment as the first choice in the treatment of chronic pain after hernia repair. If conservative treatment has failed for more than 1 year after surgery, and if pain intensity interferes with normal daily life, then triple neurectomy should be considered [13]. Various surgical procedures have been proposed, including mesh removal without neurectomy and selective or triple neurectomy with or without mesh removal. However, an optimal procedure for chronic neuropathic pain remains debatable. In the present case, the patient's pain and numbness improved following nerve block and the numbness, of which area was consistent with the dominant area of the ilioinguinal and lateral femoral cutaneous nerve. We performed the second surgery via a laparoscopic approach to figure out the cause of pain. Laparoscopic exploration during the second surgery revealed that the lateral side of the mesh was wrinkled, contracted, and involved nerve branches. It might be in line with his symptom that the pain and numbness appeared at a month after the surgery, not immediately after the surgery. Based on these findings, selective neurectomy with partial removal of the mesh via a laparoscopic approach was performed, and the pain completely resolved immediately after the surgery. In this context, surgical procedure for a patient with neuropathic inguinal pain should be selected based on an individual patient.

Laparoscopic IPOM repair for inguinal hernia is not a standard procedure, but is occasionally performed in patients who are not good candidates for TAPP or TEP repair due to a peritoneal defect or the presence of a fibrotic and scarred preperitoneal cavity [9,10]. However, in this procedure, mesh fixation by a tacker and suture may result in nerve injury, which can also be caused by nerve entrapment due to a contracted mesh, as in our case. Even if a mesh is fixed with fibrin glue, the contracted mesh may cause neuropathic pain. Therefore, repair with an anterior approach is desirable in patients with a peritoneal defect, fibrosis, or scarring at the anterior abdominal wall near the internal inguinal ring.

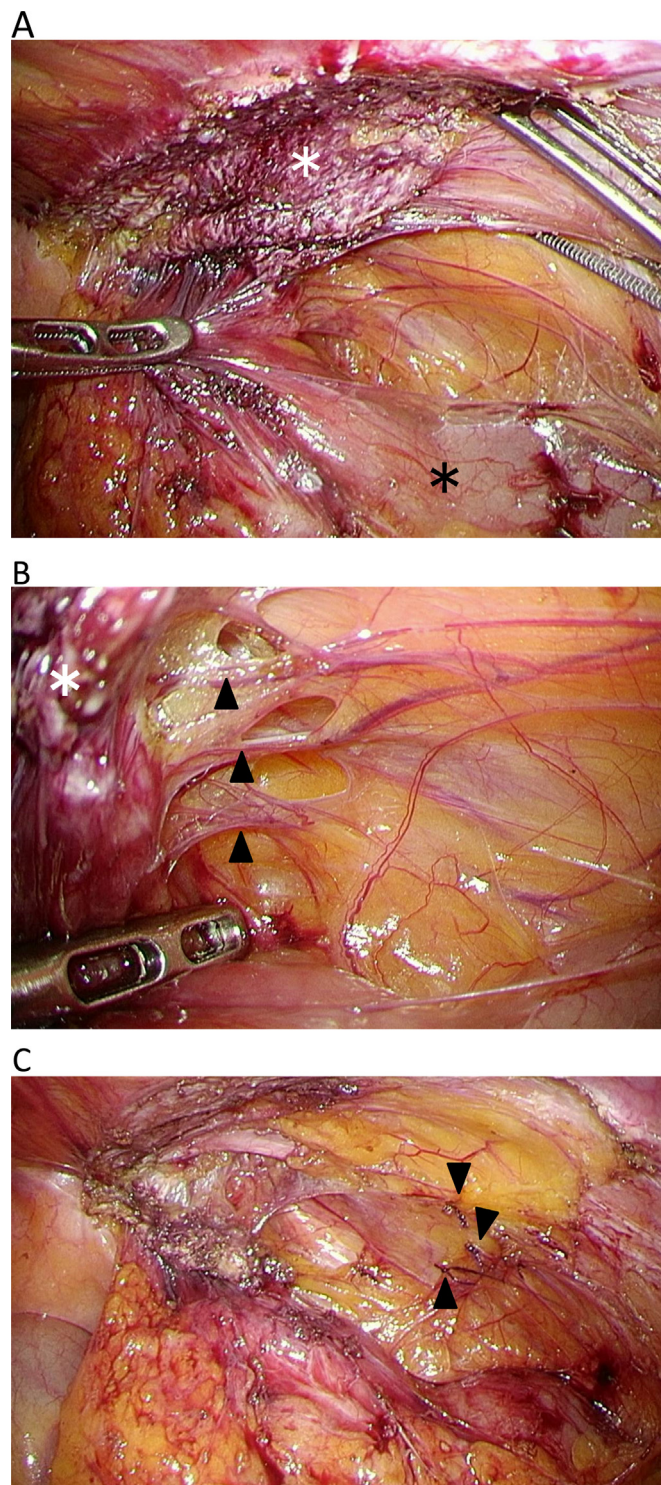


Fig. 3. Laparoscopic findings in the second surgery. (A) After the lysis of adhesions, we confirmed a contracted mesh. A white asterisk shows the contracted mesh. The black asterisk shows the cecum. (B) Laparoscopic findings of a contracted mesh involving nerve branches. Black arrowheads indicate nerve branches. The white asterisk shows the contracted mesh. (C) Laparoscopic findings after the nerve dissection. Black arrowheads indicate the proximal stump of the dissected nerves.

4. Conclusion

Laparoscopic IPOM repair for inguinal hernia may cause chronic neuropathic pain. This method should be avoided as much as possible. Laparoscopic selective neurectomy is an option for patients with chronic neuropathic pain after laparoscopic hernia repair.

Conflict of interest

All authors declare no conflicts of interest associated with this manuscript.

Funding source

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical approval

No ethical approval was needed for this manuscript.

Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

The patient has provided permission to publish these features of his case, and the identity of the patient has been protected.

Author contribution

Each author took part in the design of the study, contributed to the data collection, participated in writing the manuscript and all agreed to accept equal responsibility for the accuracy of the content of the paper.

1. Study conception and design: Hanada and Narita.
2. Drafting manuscript or critical revision of the manuscript: Hanada, Narita, and Ikai
3. Final approval of the manuscript: Hanada, Narita, Goto, Okada, Okura, Jikihara, Nakanishi, Saji, Matsusue, Hata, Yamaguchi, Otani, and Ikai.

Guarantor

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Acknowledgments

Not applicable.

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