

Focal Testicular Infarction from Laparoscopic Inguinal Hernia Repair

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ABSTRACT

A 53-year-old Caucasian male underwent laparoscopic total extraperitoneal repair of a right indirect inguinal hernia. Postoperatively, the patient developed right testicular swelling and pain that increased over the course of a week. On examination, the patient was found to have a tender, swollen, high-riding testicle, and testicular torsion was of main concern. Doppler sonography and testicular scan suggested an infarction only to the upper pole of the right testicle. Subsequent exploration of the right testicle revealed a hydrocele and focal ischemia to the upper pole of the right testicle. Intraoperative Doppler study and a urology consultation were obtained with an initial impression of possible intermittent torsion. This report describes a rare complication seen in laparoscopic inguinal hernia repairs.

CASE REPORT

The patient is a 53-year-old Caucasian male who was referred because of a symptomatic right inguinal hernia. He had no history of prior surgery, and his only past medical history was significant for hypertension, which was adequately controlled with medications. His physical examination was essentially unremarkable except for an easily reducible and palpable right inguinal hernia. Surgical options were discussed with the patient, and the patient chose to have a laparoscopic repair.

The patient subsequently underwent laparoscopic extraperitoneal repair of a right inguinal hernia with Marlex mesh. After placement of the individual trocars, the dissection of the cord was carried out. With careful blunt dissection, the cord was identified and the surrounding tissue was freed off the cord. The cord structures were clearly identified. The patient was found to have a moderately-sized, indirect hernia sac that was carefully freed off the cord. Once the hernia sac was completely reduced, a 3 x 5-inch piece of Marlex mesh was inserted. A keyhole was previously made into the mesh prior to inserting the mesh. Medially, the mesh was secured to Cooper's ligament with staples. Superiorly, it was also secured to the abdominal wall. The 2 leaves of the mesh laterally were wrapped around the cord and reapproximated laterally with staples. A second piece of Marlex mesh was then placed over the cord. A 1-inch wide by 5-inch long piece of mesh was secured medially to Cooper's ligament and laterally to the first piece of Marlex mesh. The area was dry and the procedure was quite straightforward. The preperitoneal space was deflated at the end of the case gradually, holding down the inferior edge of the mesh. The individual cannulas were then removed, and gradual pressure was applied to the scrotum to press any air out that may have been trapped. After the wounds were individually closed and sterile dressings applied, a scrotal support was placed on the patient. After recovering from the anesthesia, the patient was discharged home on postoperative analgesics. The patient was advised to continue wearing the scrotal support at home, and he was also told to expect some postoperative swelling.

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Postoperatively, the patient developed some expected right and left testicular swelling and pain. Over several days, he noted that the swelling on the left side decreased; however by the 8th postoperative day, the swelling on the right side had actually increased. On examination, the right testicle was markedly swollen with some erythema and was high-riding compared with that on the left side. Marked swelling and tenderness of the cord and testicle were present. The left side was unremarkable except for some mild residual swelling. A testicular ultrasound revealed a fairly well-defined, low-echo texture lesion in the upper pole of the right testicle. Decreased flow in this area was suspicious for an infarction. A right hydrocele was also detected. The patient underwent a Tc99m Pertechnetate testicular scan that showed hyperemia to the right side. These findings were consistent with a missed testicular torsion.

The findings were discussed with the patient, and he was taken to the OR for exploration of the right testicle. At the time of surgery, a urology consultation was also obtained. Upon entering the right scrotal sac through a transverse incision, a moderate amount of serous fluid was drained. The right testicle was then brought out and examined. The upper portion of the testicle appeared contused, and the lower half of the testicle was soft. Intraoperative Doppler evaluation revealed good pulsatile flow to the testicle. The cord was markedly thickened. A small biopsy of the upper pole of the right testicle with a frozen section was obtained, and this confirmed a process of infarction to the upper pole of the right testicle. It was felt that the patient may have experienced intermittent torsion of the right testicle.

With good pulsatile flow by Doppler to the right testicle, the testicle was preserved and a bilateral orchiopexy was performed. Postoperatively, the patient was placed on IV and later PO antibiotics as well as nonsteroidal analgesics. Gradually, the patient's condition improved. The swelling and pain slowly resolved, and the patient subsequently returned to work 6 weeks later.

DISCUSSION

Spermatic cord dissection is minimized with the laparoscopic approach and subsequently the risk of groin and testicular complications resulting from injury to cord structures and adjacent nerves should be reduced.¹ Wantz² believes that the most common cause of postoperative testicular swelling, orchitis, and ischemic atrophy

is surgical trauma to the testicular veins (ie, venous congestion and subsequent thrombosis).

Over 500,000 hernia repairs are performed every year.³ It has been estimated that the complication of ischemic orchitis and testicular atrophy occur in approximately 2% to 3% of all hernia repairs.⁴ This incidence is derived from the literature on open repairs, and the rate is actually higher for recurrent hernias. The incidence appears to be lower however in the laparoscopic group with transient cord/testicular pain at 0.9%, ischemic orchitis/epididymitis at 0.9%, hydrocele at 0.9%, and persistent cord/testicular pain at 0.6%.⁵

Ischemic orchitis is caused by thrombosis of the spermatic cord, and the testicular pathology is intensive venous congestion. Ultimately, the thrombosis is induced by surgical trauma to the cord. It has been advocated in open repairs to avoid dissection medially and inferiorly beyond the pubic tubercle. Scrotal pathology should not be addressed at the time of the hernia repair.⁶ Trauma to the spermatic cord, especially the delicate veins of the pampiniform plexus, is the paramount cause of testicular atrophy after inguinal hernioplasty.^{7,8} Dissection of an indirect hernia sac in the scrotum damages the delicate veins of the pampiniform plexus, initiates thrombosis, and coincidentally disrupts the collateral circulation.⁶ In this case, a focal infarction to the superior pole of the right testicle was diagnosed. Most infarcted testes show diffuse lesions affecting the whole testicular parenchyma and even the epididymis.⁹ The cause of infarction is usually spermatic cord torsion.¹⁰ Focal testicular infarction is a very rare occurrence. Nistal¹¹ described a 74-year-old male who developed focal testicular infarction after repair of an incarcerated hernia. The cause of the infarct did not seem to be a lesion in the testicular artery because this appeared histologically normal, and the histologic pattern of the infarct did not suggest an ischemic infarct. The hemorrhagic testicular lesions rather suggested a venous lesion.¹¹

Testicular torsion does not appear to have been described as a complication of laparoscopic inguinal herniorrhaphy in the literature as yet except in a single swine model.¹² In this case, the patient may have developed a focal area of ischemia to the upper pole of the right testicle due to intermittent torsion. During the hernia repair, excessive dissection around the cord to reduce the indirect hernia sac was not conducted or required. Despite the routine nature of the repair, the patient

developed a focal area of ischemia to the testicle that probably resulted from swelling and subsequent venous congestion. Even minimal dissection of the cord can cause potential injury to the spermatic vessels.

CONCLUSION

The most common vascular injuries experienced in laparoscopic inguinal hernia repairs are those involving the inferior epigastric vessels and the spermatic vessels with the external iliac, circumflex iliac, profunda, and obturator vessels also at risk. This case report describes a patient who developed focal testicular infarction from laparoscopic inguinal herniorrhaphy. Review of the literature reveals that this is a very rare complication. Venous congestion and swelling, rather than arterial compromise, appear to be the leading causes of ischemia to the testicle. We have recognized and acknowledged the fact that in spite of minimal and meticulous dissection around the cord an injury to the spermatic vessels can still occur.

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