A case of de Garengeot hernia: the feasibility of laparoscopic transabdominal preperitoneal hernia repair

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**Abstract**

**Introduction:** de Garengeot hernia is described as the presence of an appendix in a femoral hernia. This rare hernia usually presents with both diagnostic and therapeutic dilemmas.

**Presentation of case:** We report a case of a 59-year-old woman with a one-year history of a right irreducible femoral hernia. She underwent diagnostic laparoscopy with an intraoperative diagnosis of de Garengeot hernia. This was followed by a laparoscopic transabdominal preperitoneal (TAPP) approach for hernia repair.

**Discussion:** The long-standing presentation of de Garengeot hernia is seldomly reported in literature. There has been no standard approach of treatment for de Garengeot hernias described, possibly due to the rarity of this condition. The unusual presentation of the hernia prompted us to undergo a diagnostic laparoscopy first, during which the appendix was seen incarcerated in a femoral hernia sac. We were easily able to proceed for a laparoscopic TAPP approach for hernia repair without the need for conversion to an open repair.

**Conclusion:** We were able to obtain an accurate diagnosis of an appendix within a long-standing irreducible femoral hernia through diagnostic laparoscopy followed by transabdominal preperitoneal (TAPP) approach for hernia repair. We would like to underline the usefulness of laparoscopy as a valuable tool in the diagnosis and treatment of this unusual presentation of groin hernias.

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1. Introduction

De Garengeot hernia is described as the presence of an appendix within a femoral hernia, usually discovered incidentally during femoral hernia repair. This phenomenon occurs in 0.5–5% of all femoral hernias [1]. This rare condition was first described in 1731 by the French surgeon Rene Jacques Croissant de Garengeot [1,2]. An even rarer presentation is the presence of acute appendicitis within a femoral hernia, with an incidence of 0.08–0.13% [2]. Hevin in 1785 first described an appendectomy in one such case [2]. Fewer than 90 such cases have been reported to date [1]. Abnormal implantation of the appendix in the cecum, leading to a pelvic appendix, or a large cecum with increased mobility extending into the pelvis can allow incarceration of the appendix in the femoral hernia [2]. Complications such as rupture and abscess formation have been described in few cases [3,4]. A review of published literature indicates the incidence of de Garengeot hernias to be greater in women with a ratio of 13 to 1, paralleling the sex-related incidence of femoral hernias [2]. The preoperative diagnosis is challenging, and only few reports of a positive Computed Tomography (CT) diagnosis are available in literature [5,6]. We report a successful laparoscopic management of a 59-year-old woman who presented with a long-standing right groin mass, which turned out to be an irreducible femoral hernia containing an appendix, otherwise known as de Garengeot hernia.

2. Presentation of case

The patient was a 59-year-old woman who presented to our clinic with an irreducible swelling in the right groin region associated with intermittent pain of a one-year duration. The patient denied any fever, nausea & vomiting, change in bowel habits, or urinary symptoms. There was no history of trauma. The patients past medical history includes hypertension, paroxysmal atrial fibrillations, and Lupus nephritis, which was managed with immunosuppressive therapy 6 years prior to presentation of the current issue. On examination, the patients pulse rate was 76/min, blood pressure of 140/80 mm Hg, respiratory rate of 15/min, body temperature of 37.4 °C, and oxygen saturation of 98% on room air. Clinical examination showed manifested swelling just below the right inguinal ligament, inferior and lateral to the pubic tubercle. The swelling was irreducible but not strangulated, and was diag-

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nosed as right groin hernia, with irreducible right femoral hernia to be the most likely diagnosis. Both chest & abdominal examination were unremarkable. All laboratory investigations were within normal range.

Due to the aforementioned findings, the patient required a diagnostic laparoscopy (DL). As the patient was scheduled for a DL, this eliminated the requirement for a CT imaging, due to the fact that a DL is a diagnostic and a therapeutic method. After establishing a diagnosis, a laparoscopic transabdominal preperitoneal (TAPP) repair of the right femoral hernia was performed. This option was opted over totally extraperitoneal repair (TEP) as the peritoneum was already breached. The procedure was performed under general anesthesia with the patient placed in supine position. A supra-umbilical incision was made, and pneumoperitoneum was achieved after an open (Hasson's) technique. A 10 mm port was then inserted and a 30-degree scope was used to examine the abdominal cavity. Upon inspection, a major portion of the appendix was seen to pass through a defect adjacent to the right inguinal ligament through the femoral orifice. The cecum was found to be redundant, with a long appendix (length, 10 cm) in pelvic position (Fig. 1). Therefore, two additional 5 mm ports were placed in the left lower quadrant and suprapubic region. The peritoneum at the right groin area was dissected in a for-

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**Fig. 1.** Finding of de Garengeot hernia during diagnostic laparoscopy. A long pelvic appendix is seen passing through a defect in the right femoral region.

**Fig. 2.** Peritoneal dissection and access of the preperitoneal space for TAPP hernia repair. The peritoneum dissected and reflected to expose the right preperitoneal area.

**Fig. 3.** Incarcerated appendix in a femoral hernia orifice. The appendix is seen passing through the right femoral space medially below the inguinal ligament.
Fig. 4. Mesh repair through a transabdominal preperitoneal approach for right femoral hernia. A polypropylene mesh is seen covering the direct, indirect, and femoral hernia spaces on the right side.

Table 1
Systematic review and management results of reported de Garengeot hernia cases.

| Author          | Number of patients | Results                                                                 |
|-----------------|--------------------|-------------------------------------------------------------------------|
| Talini et al. [1] | Case report        | 86 year old male. Open hernia mesh repair                              |
| Hussain et al. [11] | Case report      | 86 year old female. Open hernia mesh repair                            |
| Kalles et al. [12] | 31                 | 25 patients underwent herniorrhaphy. 6 patients underwent open mesh repair |
| Beyens et al. [8]  | Case report        | 64 year old female. Totally extraperitoneal hernia repair (TEP)         |
| Theodoros et al. [2] | Case report      | 83 year old female. Open herniorrhaphy with no mesh                   |
| Konofaos et al. [13] | Case report     | 60 year old female. Open hernia mesh repair                            |
| Comman et al. [9]   | Case report        | 38 year old female. Transabdominal preperitoneal hernia repair (TAPP)  |
| Sharma et al. [14]  | 7                  | Open hernia mesh repair                                                |
| Own data           | Case report        | 59 year old female, TAPP                                                |

In the present case, the unusual long-standing presentation of the hernia prompted us to undergo a DL first, during which the appendix was seen incarcerated in a femoral hernia sac. In comparison to, Comman, et al. whose indication for a DL was incarceration of a segment of the omentum [9], we were easily able to proceed for a laparoscopic TAPP hernia repair without the need for conversion to an open repair. It is always recommended to undergo appendectomy for inflamed and non-inflamed appendix in de Garengeot hernia [10], therefore, a decision of appendectomy in otherwise non-inflamed appendix was taken. We safely used a polypropylene mesh in this case since the appendix was seen non-inflamed. Otherwise, the use of prosthetic material is not preferred in a contaminated field due to risk of infection, and thus herniorrhaphy is a preferred method of repair in such cases [2]. However, an advantage of laparoscopic TAPP is a short hospital stay and a fast recovery [9], which was also demonstrated in our report.
4. Conclusion

We recommend the laparoscopic approach for the diagnosis and repair of groin hernias with an atypical presentation, or when the contents of the hernia cannot be determined either by clinical or radiological exams. Here we report a rare case of a long standing de Garengeot hernia diagnosed laparoscopically and successively repaired with TAPP approach.

Conflict of interest

None.

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Ethical approval

Ethical approval and written consent was obtained and available upon request.

Consent

Informed consent was obtained from the patient for publication & available upon request.

Author contributions

(1) Dr. Saud Al-Subaie—Collecting the data, writing the paper, & drafting the article & revising it critically for important intellectual content.
(2) Dr. Hatem Mustafa—Study concept & design, data collection & writing the paper. Operating surgeon.
(3) Dr. Noura Al-Sharqawi—Writing the paper & revising it.
(4) Dr. Mohammed Al-Haddad—Collecting data.
(5) Dr. Feras Othman—Drafting the article.

Guarantor

Dr. Saud Al-Subaie.

References

[1] C. Talini, L.O. Oliveira, A.C. Araújo, F.A. Netto, A.F. Westphalen, De Garengeot hernia: case report and review, Int. J. Surg. Case Rep. 8C (2015) 35–37.
[2] Piperos Theodoros, et al., Clinical significance of de Garengeot's hernia: a case of acute appendicitis and review of the literature, Int. J. Surg. Case Rep. 3 (3) (2012) 116–117.
[3] L.C. Cuoto, et al., Acute suppurative appendicitis occurring within femoral hernia: report of a case, Dis. Colon Rectum 21 (1978) 203–204.
[4] A.J. Voitl, J.K. MacFarlane, R.L. Estrada, Ruptured appendicitis in femoral hernias: report of two cases and review of the literature, Ann. Surg. 179 (1974) 24–26.
[5] Y. Fukukura, S.D. Chang, Acute appendicitis within a femoral hernia: multidetector CT findings, Abdom. Imaging 30 (2005) 620–622.
[6] R. Zissin, O. Brautbar, M. Shapiro-Feinburg, CT diagnosis of acute appendicitis in a femoral hernia, Br. J. Radiol. 73 (2000) 1013–1014.
[7] H.M. Schäfer, U. von Holzen, C. Nebiker, Swelling of the right thigh for over 30 years—the rare finding of a De Garengeot hernia, Int. J. Surg. Case Rep. 5 (12) (2014) 1120–1122.
[8] M. Baysens, L. Haerck, K. Vindevoghel, Laparoscopic appendectomy combined with TEP for de Garengeot hernia: case report, Acta Chir. Belg. 113 (6 (November–December)) (2013) 468–470.
[9] A. Comman, P. Gaertzschmann, T. Hanner, M. Behrend, Hernia transabdominal preperitoneal hernia repair and appendectomy, JSLS 11 (4 (October–December)) (2007) 496–501.
[10] L. Wise, N. Tanner, Strangulated femoral hernia appendix with perforated sigmoid diverticulitis, Proc. R. Soc. Med. 56 (1963) 1105.
[11] A. Hussain, A.A. Slessor, S. Monib, J. Maalo, M. Soskin, J. Arbuckle, A. De Garengeot hernia masquerading as a strangulated femoral hernia, Int. J. Surg. Case Rep. 5 (10) (2014) 656–658.
[12] V. Kalles, et al., De Garengeot’s hernia: a comprehensive review, Hernia 17 (April 2) (2013) 177–182.
[13] P. Konofaos, E. Spartalis, A. Smirnis, K. Kozontzoglou, G. Kourakis, De Garengeot’s hernia in a 60-year-old woman: a case report, J. Med. Case Rep. 30 (June 5) (2011) 258.
[14] H. Sharma, P.K. Jha, N.S. Shekhawat, B. Memon, M.A. Memon, De Garengeot hernia: an analysis of our experience, Hernia 11 (June 3) (2007) 235–238.