

Hernia of De Garengeot an up to date of diagnosis, initial management and treatment: a narrative review and a case study report

Hernia de De Garengeot: diagnóstico, manejo inicial y tratamiento actualizados: una revisión narrativa y un informe de estudio de caso

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ABSTRACT: Introduction: A De Garengeot hernia is defined by a femoral hernia containing the appendix. Acute appendicitis within a femoral hernia is an extremely rare surgical presentation and occurs in only 0.08-0.013% of cases cited in the literature and 5 to 15% of all femoral hernias. **Case Presentation:** A 53-year-old woman presented to the emergency room of our hospital in our ward with acute onset of a right-sided inguinal swelling that occurred earlier that day after performing a heavy lift. Her examination revealed acute appendicitis contained within an incarcerated right femoral hernia. The patient underwent laparoscopic appendectomy with open femoral hernia repair. Intraoperatively, the tip of the appendix was incarcerated within the hernial sac. She was removed through the open inguinal incision after the base of the appendix has been divided laparoscopically. The final pathology showed acute inflamed appendicitis with no evidence of neoplasm. **Discussion:** Physicians should be aware of the rare extent of an unusual presentation of appendicitis such as well as surgical options for treatment. The literature does not conclude on a gold standard for the method of approach. **Conclusion:** De Garengeot's hernia remains a rare and unusual surgical presentation of femoral hernia, and the complication of the case by incarceration leading to acute appendicitis provides a challenging surgical approach that should be personalized for each patient.

KEYWORDS: Femoral hernia, De Garengeot Hernia, Surgery & Appendix.

INTRODUCTION

Hernias of the abdominal wall from lat. hernia which means lump or swelling that protrudes through the abdomen or gr. Hernios, which means outbreak, are a very diverse group of pathologies, and although they have common characteristics between them, in medical practice we will find that each case is different from the other, not only for its anatomical characteristics, but also for the context of the patient who suffers from it.

It cannot be said that all hernias are the same and there is an interest in understanding this pathology further. During the development of this topic we will see the whole spectrum of the pathology. The hernia of the abdominal wall is a pathology that arises with the erection of the man. The Egyptians

(1500 BC), the Phoenicians (900 BC) and the ancient Greeks (Hippocrates, 400 BC), have records of probable diagnosed hernias. The most ancient data concerning the hernia correspond to the Egyptians. It is said that the mummy by Pharaoh Merneptah (1224-1214 BC) shows an inguinal incision which has been interpreted as a hernia operation. Shows the mummy of Ramses V (20th dynasty). Apparently unoperated inguinal hernia sac.

Garengeot's hernia corresponds to a subtype of complicated femoral hernia, which contains an inflamed appendix, was first described by the French surgeon René-Jacques Croissant De Garengeot (De Garengeot, 1731). He described a 55-year-old woman who developed tenderness and a lump in her upper right thigh after lifting 24 pounds of bread. The swelling could not be reduced and over the next 4 days the overlying skin became erythematous. The

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patient was thought to have an abscess and after an incision was made in the groin, a femoral hernia was found that contained foul-smelling purulent fluid and a structure that resembled a “finger” near the femoral vessels. The structure was reduced back into the peritoneal cavity and the wound was allowed to heal by secondary intention and the patient achieved adequate recovery in 6 weeks. In 1735, another French surgeon, Claudius Amyand, described the first reported appendectomy in which the appendix protruded through an inguinal hernia. In 1785, Hévin published the first article describing the surgical management of femoral appendicitis. The term “De Garegeot hernia” was first used by Akopian *et al.* who attributed to De Garegeot the merit of having first described this type of hernia (Akopian & Alexander, 2005). De Garegeot hernias are rare, with an estimated incidence of between 0.15 and 5% of all femoral hernias

CLINICAL PRESENTATION

Clinical presentation corresponds to a very particular type of femoral or crural hernia with an incarcerated appendix inside, The diagnosis time is 3 days from the onset of the symptoms presented; and it can be asymptomatic in 68.7% of cases, which can manifest in the rest with subfebrile periods and pain in the left flank or hypogastrium, in some cases with edema and swelling and that is found incidentally in other surgical procedures such as hernia repair, laparotomy and emergency procedures.

Physical exam

Garegeot’s hernia can manifest with non-specific pain in the inguinal or right femoral region not attributable to another event or medical procedure, accompanied by a tumor, which can worsen with changes in position and physical exertion. Unlike direct or indirect hernias, the peritoneal sac passes under the inguinal ligament and medial to the femoral vessels towards the femoral region, it is not related to the inguinal canal, which can cause unspecific discomfort, poorly localized pain and subfebrile periods that may or may not raise the inflammatory parameters (Guenther *et al.*, 2021).

Paraclinical and Complementary Exams

Only exceptional, (Theodorou *et al.*, 2021) and (Biondi *et al.*, 2016), report after an adequate physical examination. Complete blood count, VHS, CRP and leukocyte count may be slightly elevated due to inflammatory processes caused by strangulation of the appendix. The diagnostic confirmation test with the highest positive predictive value is nuclear magnetic resonance (MRI), computed tomography and finally ultrasound and x-rays to a lesser extent.

Case presentation

A 53-year-old woman was admitted to our ward for the sudden onset of a painful swelling in the right femoral region. In the anamnesis, there is no noteworthy pathology. Physical examination re-

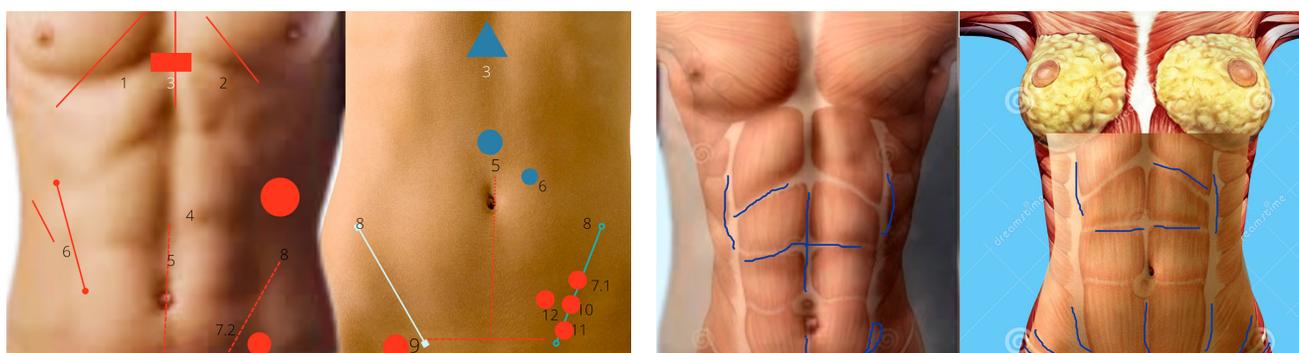


Figure 1. Topographic anatomical description on the surface of the different types of direct and indirect hernias in the human body. The blue lines represent the areas of weakness of the abdominal wall as described by Rouviere. The most prevalent form hernia in women are umbilical hernia and in older women are obturator hernia with CT diagnostic technique. The images are obtained by shutterstock and dreamstime free license *shutterstock-129805100* and *istockphoto157484993 612x612*.

1. Symboly: 1, 2. Weak zone generation of Hernia (in blue) 3. Epigastric hernia 4. Dorso-lumbar hernia 5. Umbilical hernia 6. Spigelian hernia 7.1 Obturator hernia 7.2 Crural hernia Garegeot at the moment by means of an ultrasound and en-contrado en un cirugía en la reparación femoral de una hernia. 8. Inguinal ligament. 9. Obturator hernia Richter’s hernia 10. Litre’s hernia 11. Amyiand’s hernia 12. Aymart’s hernia.

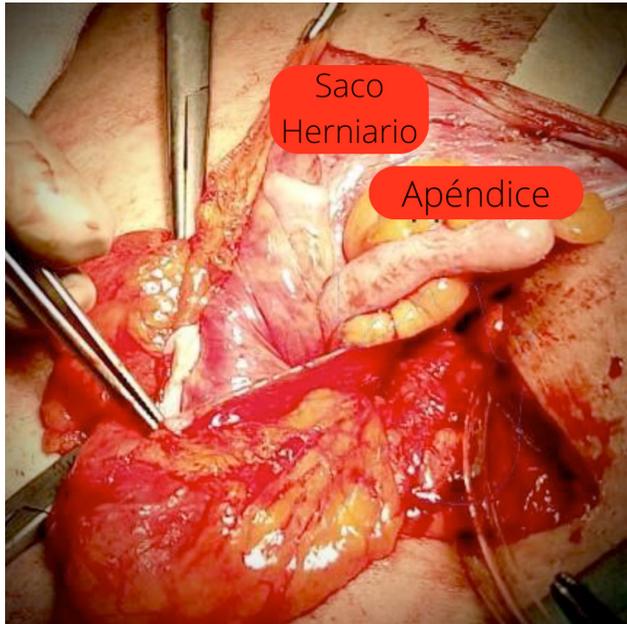


Figure 2. Presence of the incarcerated appendix inside the hernial sac. The hernial sac is observed delimited by the inguinal ligament, mesoappendix and Cowper's ligament.

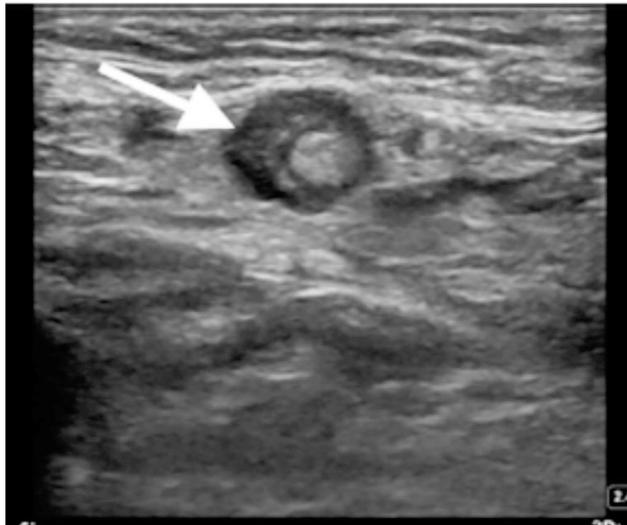


Figure 3. Presence of the vermiform appendix inside the hernial sac that runs under the inguinal canal. Once the ultrasound image was obtained, the repair of the hernia was enhanced with a prosthesis and the removal of the appendix.

vealed a body temperature of 36.5, pain in the right femoral region. Hematology tests revealed a white blood cell count of 4,500, hemoglobin of 11.9 g/dl, CRP of 0.3 mg/dl, albumin of 4.2 g/dl, BUN = 22, and creatinine of 0.9; indicative of a mild inflammatory process. The ultrasound was indicative of a typical

strangulated femoral hernia and, with this indication, the patient underwent emergency surgery. The contents of the hernial sac consisted of the caecal appendix, which showed no signs of inflammation, so hernia plastic surgery was performed using a prosthetic device. The postoperative period was smooth and there were no signs of wound infection or hernia recurrence two weeks and one year after surgery. Because the clinical signs are nonspecific and the radiological findings difficult to interpret, finding an appendix within a femoral hernial sac is often an unexpected finding during surgery for a strangulated femoral hernia.

DISCUSSION

In the present case, a classic clinical presentation of Garengeot's hernia was observed, given the patient's age, sex, and clinical presentation. It should be noted that the patient was admitted for elective femoral hernia repair surgery and ended corresponding to a Garengeot hernia. It should be noted that the origin of this hernia lies in a defect in the closure of the paraxial mesoderm with the endoderm in the conformation of the union of the transversalis fascia, which only faces its most ununited planes. On the other hand, the clinical presentation of the implantation of the mesoappendix and the vermiform appendix in the right iliac fossa second to the inguinal vessels is the cause in many cases of this atypical clinical presentation, which constitutes a true diagnostic challenge given the low frequency and the difficult imaging interpretation which alone can be achieved with an adequate physical examination but complemented with an RN which will allow a diagnostic certainty. In our case, the patient had presented a /slight history of pain in the right femoral region accompanied by a very slight elevation of inflammatory parameters, which constituted a true finding at the time of the patient's operation, since it was inside the hernial sac due to Below the epigastric vessels, an appendix was strangulated, so the defect in the abdominal wall was removed and repaired using a metal prosthesis. (Biondi *et al.*, 2017) suggest the superiority of laparoscopic surgery, compared to appendectomy surgery, since appendectomy was associated with a shorter hospital stay (2.7 ± 2.5 days in LA and 1.4 ± 0.6 days in OA), with a less need for analgesia and with a faster return to daily activities (11.5 ± 3.1 days in LA and 16.1 ± 8 cm OA). Operative time was significantly shorter in the open group

(31.36 ± 11.13 min in OA and 54.9 ± 14.2 in LA). Total number of complications was less in the LA group with a significantly lower incidence of wound infection (1.4% vs 10.6%, $P < 0.001$). (Tartaglia *et al.*, 2017) propose performing laparoscopic surgeries in case the appendix is not completely inflamed, while at the time of appendicitis they recommend performing a combined open surgery with a laparoscopic one in order to be able to completely resect the appendix. At the same time, cases have been reported not only of incarceration of the appendix, but also of appendicular rupture with the presence of abscesses, which have required drainage and a fistulectomy, which can subsequently be closed electively, as discussed by (Voight *et al.*, 2010).

In our case, as stipulated in previous paragraphs, the fact of having strangulated the Hernia, the approach to hernia is always done in the open, never laparoscopically. A protector was placed. A prolene plastic prosthesis was inserted according to Trabucco (Campanelli *et al.*, 2016), (Alessio, 2020).

The hernia found in our case is largely based on the case presented by Rand *et al.*, in 2000, where the patient presented a largely asymptomatic course of the disease and it was an incidental finding using multichannel tomography in this case and subsequent pathological study of the biopsy of the appendix where we can classify this type of Garengéot's hernia, according to the classification of Theodorou as a hernia with incarcerated and inflamed appendix 2b according to the age and evolution of the clinical presentation of our patient (Theodorou *et al.*, 2021).

CONCLUSION

Garengéot's hernia should be suspected by the surgical team as a differential diagnosis of acute appendicitis, in patients with right-sided groin pain. To do this, it must be confirmed with a diagnostic image, ideally a nuclear magnetic resonance, a CT scan or an ultrasound co-image for confirmation, since it is nonspecific and often asymptomatic, which often leads to being an incidental finding within another surgery when faced with this pathology.

Contributions & Disclosures

Contributors: All authors stated above have provided substantial contribution towards this

abstract and have met the conditions required. MR: writing abstract, planning of case report. TH: research into hernia and contributing to finalizing abstract design. MSQ: operating on patient and discovering hernia, planning of case report. JP: operating on patients, overseeing project.

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