



Contents lists available at ScienceDirect

## International Journal of Surgery Case Reports

journal homepage: [www.casereports.com](http://www.casereports.com)

## Swelling of the right thigh for over 30 years—The rare finding of a De Garengéot hernia



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## ARTICLE INFO

## Article history:

Received 5 July 2014

Received in revised form 1 November 2014

Accepted 2 November 2014

Available online 11 November 2014

## Keywords:

De Garengéot  
Femoral hernia  
Appendicitis  
Nuck cyst

## ABSTRACT

**INTRODUCTION:** Femoral hernias may – in some rare cases – contain the appendix, a phenomenon called de Garengéot hernia. It is usually an incidental finding in hernia repair. We found our case to be of interest because of the long standing femoral swelling before peracute appendicitis led to its removal.

**PRESENTATION OF CASE:** We present the case of a 71-year-old woman with a swelling of the right medial thigh for over more than 30 years. When the swelling suddenly grew in size and became tender, she was referred to our emergency department. Sonographically as well as clinically a femoral hernia was diagnosed. Intraoperatively, the appendix was found and open appendectomy as well as a hernioplasty was performed.

**DISCUSSION:** Open appendectomy is an elegant and safe procedure to repair a long standing de Garengéot hernia. Most case reports call for extensive diagnostics such as CT scan etc. We found a sonography of the femoral region to be conclusive.

**CONCLUSION:** Apart from the inherent risk of sudden incarceration in hernias, De Garengéot hernias can also develop peracute appendicitis years after their formation. This differential diagnosis needs to be taken into consideration in patients presenting with the clinical signs of a femoral hernia.

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## 1. Introduction

Our patient presented with a long-standing femoral swelling that had increased in size over a couple of days. A sonography of the femoral region revealed a tubulous structure in a cystic formation. Intraoperatively, we found the edematous appendix in a femoral hernial sac.

There are less than 30 case reports on this topic to be found in Pubmed. In most cases, a CT-scan is performed since the clinical presentation is rather unspecific. Even then, a precise diagnosis is frequently made only intraoperatively. In our case, sonography led us to the diagnosis preoperatively. We were able to match the preoperative sonographic pictures with a strikingly clear operative site.

## 2. Presentation of case

A 71-year-old woman presented to the emergency department with a swelling of the right thigh with no history of previous abdominal surgery. According to the patient, the swelling had appeared more than 30 years ago without a triggering event. It had receded and reappeared on a regular basis without any obvious

correlation to physical activity, bowel movements etc. It had never caused any discomfort.

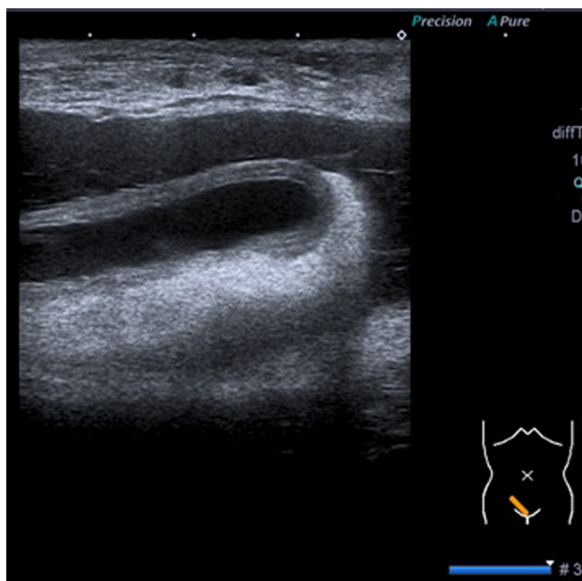
Over the last couple of days, the swelling had grown in size and become slightly indurated as well as sensitive to touch. A magnetic resonance imaging of the lower abdomen and upper thigh had been performed several years ago and revealed a hernia or cyst. However, it was unclear whether there was a cyst along an open processus vaginalis (also called Nuck cyst) or a simple femoral hernia. At that time MRI scan was without consequences, no further diagnostics or therapy were performed.

On clinical examination the patient presented with an elastic swelling in the right medial femoral region, measuring approximately 6 cm × 3 cm with a slight tenderness. The protrusion was not reducible. Abdominal pain was denied. Laboratory values showed a slightly elevated C-reactive protein (20.3 mg/l) but were otherwise regular. Body temperature was not elevated.

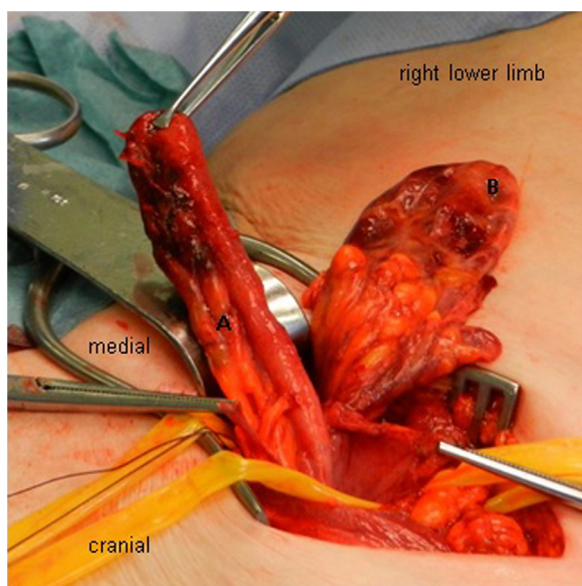
Sonography was performed and showed a cystic lesion (10 cm × 4 cm × 3 cm) with an intraluminal tubulous structure, protruding from intraabdominally through a 3 mm opening (Slide 1). Doppler examination provided evidence of vascularization.

An inguinal access was performed with an incision low enough for a femoral as well as an inguinal hernia repair. Intraoperatively, a De Garengéot hernia – a femoral hernia containing the appendix – was found (Slide 2). The hernial sac, starting just underneath the inguinal ligament, was mobilized bluntly and extracted in toto from its femoral location. Open appendectomy and femoral hernia repair

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Slide 1. Sonography.



Slide 2. Intraoperative site. (A) Appendix, (B) hernial sac.

using the McVay technique was performed. The histology report revealed an appendix with regular mucosa and acute fibrinous serositis. Postoperatively, the discomfort in the right inguinal and femoral area disappeared. The patient had an uneventful recovery and was discharged on the third postoperative day.

### 3. Discussion

In general, De Garengeot's hernia is rare. As a subgroup of femoral hernias, De Garengeot's gender incidence parallels the incidence of femoral hernia and is thus more frequent in women than in men (f:m = 3:1) [1]. Femoral hernias account for less than 10% of all groin hernias [2], with De Garengeot's accounting for 0.8–1% [3].

Diagnosis is difficult to make as the physical examination is often inconclusive as are laboratory values and imagery. In the literature, CT appears to be superior to both sonography and X-ray [4–8]. Surprisingly, only a single case report lists sonography as the revealing diagnostic of De Garengeot's hernia [9]. As the femoral

area presents itself readily to sonographic access, we found it a reliable diagnostic tool that led us to correctly predict the intraoperative diagnosis.

Sonography is relatively inexpensive, almost ubiquitously available and free of ionizing radiation, making it preferable to a CT scan, the gold standard diagnostic tool for De Garengeot's hernia [7]. Even more so when considering the fact that the exact diagnosis is most often being made only intraoperatively [9]. One report even recommends MRI as diagnostic tool in young patients or pregnant women [8]. In groin pain we generally propose sonography as an initial diagnostic tool as opposed to CT or even MRI.

The treatment for De Garengeot's hernia is prompt appendectomy and hernioplasty. Due to the rarity of the condition there is no standard procedure. Appendectomy via the hernial sac is considered adequate, in case of perforation and abscess formation a transabdominal access is preferred [10]. Ramsingh et al. describe the first combined open (hernia repair) and laparoscopic (appendectomy) management of a De Garengeot's hernia. Rather than subjecting the patient to two different procedures we limited the surgery to an open approach in the groin in order to avoid peritoneal contamination.

In the absence of abscess formation or perforation, an implantation of synthetic grafts has been described as the hernia repair of choice [10–12]. In case of infection, Cooper's ligament repair should be used, because there is a risk of infection spread to the implanted prosthesis [11].

No conclusive explanation can be given for the sudden inflammation of this apparently longstanding condition in our patient. In the literature, divergent opinions can be found on the chronology of events in an inflamed appendix in a hernial sac. Barbaros et al. blame the rigid narrow confines of the femoral canal leading to extraluminal obstruction of the vermiform appendix, potentially leading to ischemia, inflammation, necrosis and subsequent perforation [13]. Others suggest that there is an initial inflammation of the appendix and a subsequent migration into the hernial sac. Given the long-standing presence of a femoral hernia in this patient, neither one of these explanations is convincing. A primary appendicitis within the hernial sac appears to us as the most likely sequence of events.

### 4. Conclusion

Although our case report is not the first description of a De Garengeot's hernia in the literature, the long asymptomatic history over many years is quite uncommon.

### Conflict of interest

The authors declare no conflicts of interest.

### Funding

No source of funding.

### Ethical approval

As no data are being published that could violate the patient's privacy, no formal written consent was asked for.

### Author contributions

Hannah Maria Schäfer helped in writing the manuscript. Christian Nebiker helped in carrying out the surgery, case management and final approval of the manuscript. Urs von Holzen also helped in final approval of the manuscript.

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