De Garengeot’s Hernia: A rare presentation of an ischemic appendix within a strangulated femoral hernia in an elderly male

Wahid Abdul, Charlotte Thomas, Keshav Swarnkar

ABSTRACT

Introduction: De Garengeot’s hernia; the presence of a vermiform appendix in the femoral hernia sac, is a rare occurrence. Due to the paucity of cases and no large case series yet published, the incidence of De Garengeot’s hernia is reported between 0.5–5%. Femoral hernias account for less than 5% of all groin hernias and are three times more common amongst females and amongst the elderly. We report an unusual case of an 84-year-old male patient with a strangulated femoral hernia sac containing an ischemic appendix.

Case Report: An 84-year-old male presented to the emergency department with a 48 hour history of an increasingly painful right-sided groin swelling. A clinical diagnosis of an incarcerated right inguinal hernia was made and the area surgically explored. At exploration, an incarcerated femoral hernia sac containing an ischemic appendix was discovered. Appendicectomy was performed and the hernia defect repaired with nylon sutures. Post-operatively no surgical complications were encountered and histological report confirmed clinical findings.

Conclusion: The presence of a vermiform appendix in the femoral hernia sac is a rare occurrence, and has been more commonly reported amongst female patients. Due to atypical presentation, preoperative diagnosis of De Garengeot’s hernia is difficult. Early surgical intervention avoids potential complications.
De Garengeot’s Hernia: A rare presentation of an ischemic appendix within a strangulated femoral hernia in an elderly male

Wahid Abdul, Charlotte Thomas, Keshav Swarnkar

ABSTRACT

Introduction: De Garengeot’s hernia; the presence of a vermiform appendix in the femoral hernia sac, is a rare occurrence. Due to the paucity of cases and no large case series yet published, the incidence of De Garengeot’s hernia is reported between 0.5–5%. Femoral hernias account for less than 5% of all groin hernias and are three times more common amongst females and amongst the elderly. We report an unusual case of an 84-year-old male patient with a strangulated femoral hernia sac containing an ischemic appendix. Case Report: An 84-year-old male presented to the emergency department with a 48 hour history of an increasingly painful right-sided groin swelling. A clinical diagnosis of an incarcerated right inguinal hernia was made and the area surgically explored. At exploration, an incarcerated femoral hernia sac containing an ischemic appendix was discovered. Appendicectomy was performed and the hernia defect repaired with nylon sutures. Post-operatively no surgical complications were encountered and histological report confirmed clinical findings. Conclusion: The presence of a vermiform appendix in the femoral hernia sac is a rare occurrence, and has been more commonly reported amongst female patients. Due to atypical presentation, preoperative diagnosis of De Garengeot’s hernia is difficult. Early surgical intervention avoids potential complications.

Keywords: De Garengeot’s Hernia, Ischemic appendix, Groin hernia, Appendicectomy

INTRODUCTION

The incidence of acute appendicitis in the general population during their lifetime is approximately 7% [1, 2]. In the United States, 96% of all groin hernias are inguinal and 4% are femoral with approximately 27,000 cases of femoral hernias encountered per year [3, 4]. The reported female-to-male ratio of femoral hernias varies between 3:1 [3] to 6:1 [5] and are more commonly observed in elderly women.

In the early 18th century, Rene Jacques Croissant De Garengeot reported the presence of a vermiform appendix in a femoral hernia sac and this was coined De Garengeot’s Hernia [6, 7]. However, the first appendicectomy in a femoral hernia sac was only performed fifty-four years later by Herin [6].

The presence of a vermiform appendix in a femoral hernia sac is very uncommon with an estimated incidence between 0.5–5%, whilst appendicitis in a femoral hernia
is a far more uncommon finding [6, 8]. Due to this
infrequent occurrence, it is only mentioned sparingly in
literature, predominantly in the form of case reports.

We report an unusual case of an 84-year-old male
patient with a strangulated femoral hernia sac containing
an ischemic appendix.

CASE REPORT

An 84-year-old male was presented to accident and
department complaining of a two-day history of
increasing, constant right groin pain and swelling. The
patient underwent bilateral inguinal hernia repair 10 years
ago and suffered a recurrence of right inguinal hernia
during 2012; subsequently managed conservatively as he
was deemed not medically fit for operative repair and the
hernia had rarely concerned the patient.

The patient began to experience nausea, vomiting and
poor appetite prior to the onset of pain. Furthermore,
he noticed he had not opened his bowels for three days
and was unsure whether he was passing flatus which was
unusual for him.

His past medical history included NSTEMI, congestive
cardiac failure, hypertension, hypothyroidism, COPD,
transitional cell carcinoma of bladder and Parkinson’s
Disease. Medications included tamsulosin, aspirin,
nicorandil, levothyroxine, simvastatin, bisoprolol,
bumetanide, diazepam and ramipril.

On clinical examination, the patient was in moderate
distress. However, vital signs were stable and he was
afebrile. Abdominal examination revealed severe
tenderness located over the right groin lump; the lump
was tender and irreducible and bowel sounds were
present. There were no palpable masses and digital rectal
examination was normal.

Blood tests revealed an elevated C-reactive
protein (CRP) of 43.3 whilst an abdominal X-ray was
unremarkable. A working diagnosis of an incarcerated
right inguinal hernia was made and due to the urgency
of clinical presentation he was listed for emergency
exploration of the right groin lump with a view to
proceeding, if necessary.

An incision was made across the groin crease directly
overlying the groin swelling. Exploration of the inguinal
area revealed no hernia sac. The femoral canal was
explored and incidentally an incarcerated femoral hernia
sac containing an ischemic appendix was identified
(Figure 1). The appendix base was easily delivered into
the wound. As the cecum could not be delivered into the
wound, the appendix was ligated and divided proximally
close to the cecum; visible at the widened femoral
ring. The base of the appendix was transfixed and an
appendectomy performed through the same incision. A
lower midline laparotomy was contemplated. However,
due to patients’ co-morbidities this less invasive
procedure was persevered with. The hernia defect was
closed with 2-0 nylon sutures. The fascia was closed with
vicryl sutures and monocryl sutures were used for the
subcuticular layer. The resected appendix specimen was
sent for histopathology (Figure 2).

Postoperatively, the patient developed a chest
infection which was treated with intravenous antibiotics.
Histopathology report confirmed atrophic and ischemic
changes of the appendix.

DISCUSSION

Femoral hernias predominantly occur in women with
a female to male ratio varying between 3:1 [3] and 6:1
[5]. The incidence of femoral hernia in men is around 2%
[5, 9]. Due to the narrowness and rigidity of the femoral
canal, femoral hernias have a higher rate of incarceration
compared to inguinal hernias (56% compared to 6–10%)
[10].

Factors increasing intra-abdominal pressure, and
thereby predisposing to femoral hernias, include
pregnancy, obesity, pelvic mass, urinary retention and
constipation. Furthermore, weakening of transversalis
fascia may be implicated. Our patient presented with
a three-day history of constipation which may have
contributed to the femoral hernia.

In 1731, Rene Jacques Croissant De Garengeot first

Figure 1: Anatomy of the femoral canal illustrating the position
of the De Garengeot’s Hernia.

Figure 2: Excised appendix specimen present in the femoral
hernia sac.
reported the presence of an appendix in a femoral hernia sac. Fifty-four years later, Herin performed the first appendicectomy in a femoral hernia sac [6]. The term De Garengeot’s Hernia includes either a normal, inflamed, perforated or gangrenous appendix in a femoral hernia sac. De Garengeot’s Hernia is a rare occurrence, often presenting with a painful lump inferior to the inguinal ligament [11]. Our patient presented with a painful lump in his right groin which was clinically diagnosed as an incarcerated right inguinal hernia.

Wakeley reported a 0.1% incidence of vermiform appendix in a femoral hernia in a personal case series on 655 patients [12] whilst Ryan reported a 0.13% incidence of acute appendicitis in an external hernia amongst 8692 cases [13]. However, due to the paucity of cases and no large case series yet published, the incidence of De Garengeot’s Hernia is reported to be between 0.5–5% [6, 8, 14].

The majority of De Garengeot’s Hernia reported in literature involved elderly women with the mean age of 69 years [4]. Our patient was an elderly male, thereby demonstrating uncommon presentation in this population group.

**Pathogenesis**

The hernia sac can often contain preperitoneal fat, omentum, colon or small bowel. The pathogenesis of De Garengeot’s hernia is controversial. One of the theories; the congenital theory, proposes that abnormal attachment of appendix onto the cecum predisposes to pelvic appendix which can enter the hernia sac of the pelvic peritoneum [4, 9]. Other theories propose either primary or secondary obstructive events, with the latter as a results of constriction of appendix by a tight hernia neck-sac as a cause of appendicitis in femoral hernia. The latter theory may have contributed to the presentation in our patient, as he was constipated for three days without passing flatus and was vomiting.

**Clinical Features**

Diagnosing femoral hernias preoperatively is challenging due to the difficulty in palpating the hernia in asymptomatic patients and the resemblance to inguinal hernia when hernia is swollen and inflamed. Furthermore, they can present as thigh or groin swellings. Pain from appendicectomy is usually of a cramping nature rather than constant [15]. Our patient described a constant groin pain which would have made the clinical diagnosis of femoral hernia difficult.

Preoperative diagnosis of De Garengeot’s hernia is difficult, and is frequently made at surgery with only one case reported in literature of diagnosis pre-operatively, with the aid of a CT scan [16]. As with our case, the initial clinical diagnosis of an incarcerated right inguinal hernia was disproved upon surgery and a De Garengeot’s hernia was identified.

Appendicitis in the elderly is often difficult to diagnose with approximately 50% cases being perforated during surgery compared to only 20% in young adults. Furthermore only 20% of patients aged 60 years and above have classical features such as fever, right lower quadrant pain and leukocytosis [17]. Our patient was an 84-year-old and only presented with right groin pain with an elevated CRP. The absence of these classical features may provide a possible explanation as to why an ischemic appendix was identified at exploration rather than appendicitis.

**Repair**

Due to the paucity of De Garengeot’s hernia cases there are no standard treatment for De Garengeot’s hernia. Management includes either; incision and drainage with a delayed appendicectomy or an immediate appendicectomy and repair of hernia sac using McVay’s repair [4]. McVay’s repair employs non-absorbable interrupted sutures to bring the conjoint tendon to Cooper’s ligament from the pubic tubercle to the femoral vein [18]. This technique was employed in our patient at exploration.

Early surgical treatment is vital to prevent potential complications. Postoperative monitoring of patients is vital as approximately one-third of the patients with De Garengeot’s Hernia repair have an infection post-operatively [11]. Due to early surgical intervention our patient may have avoided these potential complications.

The majority of De Garengeot’s Hernia cases observed and described in the literature were observed women. De Garengeot’s Hernia in males are less common and therefore less frequently mentioned in literature. Cases described in literature commonly involved the right side of the groin with Scepi et al. (1993) reporting a case presenting in the left groin region [19].

Shum J and Croome K (2012) described a case of a 72-year-old male with a previous right sided non-mesh inguinal hernia repair, presenting with a three-day history of swollen, tender mass in the right inguinal region. During exploration, the appendix was inflamed within the femoral hernia sac and an appendicectomy followed by hernia sac repair using McVay’s technique with interrupted non-absorbable sutures was performed [18].

Pitchaimuthu and Dace (2009) reported the youngest male patient with De Garengeot’s Hernia; a 40-year-old male who had presented with a week-long history of a painful right-sided groin swelling. During exploration, a mildly inflamed appendix was identified as an incarcerated femoral hernia. An appendicectomy, followed by Lichtenstein hernia repair, was performed [20].

Wiszniowski et al. (2008) reported a 55-year-old male who had presented with a four-day history of a painful
right-sided groin swelling. On examination a 10x5cm painful mass was present in the right groin and a working diagnosis of an incarcerated right inguinal hernia was suspected. Intra-operatively, the femoral hernia sac contained a gangrenous, inflamed, non-perforated appendix which was excised and the femoral hernia was repaired [21].

In a case series, Sharma et al. retrospectively analyzed 457 femoral hernia repairs performed during January 1991 to September 2006 and identified seven patients with De Garengoet’s hernia. Six of these patients had an acute presentation with an average of 24–48 hours history of symptoms. All seven patients had normal white cell counts and were approached using an infrainguinal incision. Three of these patients had an inflamed appendix, one was perforated with the remainder being normal. In all of these cases the femoral hernia was repaired using prolene mesh in normal appendix, whilst abnormal appendixes were excised and the femoral canal was closed with interrupted prolene sutures [11].

In another case report, an 88-year-old male presented with a two-day history of a painful right-sided groin mass. Clinically, a 6 cm tender non-reducible right inguinal mass was palpated and a presumptive diagnosis, of a strangulated inguinal hernia, was made. During surgery, a femoral hernia sac containing a perforated appendix was identified. Following appendicectomy, the femoral hernia was repaired. Histopathological studies subsequently reported an acute-on-chronic appendicitis with perforation of appendix [4].

Isaacs and Felsenstein (2002) described a 76-year-old man with a 6-year history of right groin hernia presented with a two-day history of right groin pain and increased swelling. During operative repair the hernia sac containing an inflamed appendix was found within the femoral canal. The appendix was excised and the hernia sac repaired using McVay’s technique [7].

CONCLUSION

De Garengoet’s Hernia; the presence of a vermiform appendix in a femoral hernia sac, is an unusual occurrence which is commonly observed in women and in elderly patients. De Garengoet’s hernia is commonly encountered on the right side as a groin swelling. Preoperative diagnosis is challenging and, without radiological investigations, it is often made intra-operatively. Early surgical intervention is imperative to prevent potential complications. This is a case of an elderly male with a two-day history of right groin pain and swelling with an elevated C-reactive protein. Upon surgical exploration De Garengoet’s hernia was identified. Our case represents another rare case of De Garengoet’s Hernia, in an uncommon population group.

**********

Author Contributions

Wahid Abdul – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Charlotte Thomas – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published
Keshav Swarnkar – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

Copyright

© 2014 Wahid Abdul et al. This article is distributed under the terms of Creative Commons Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original publisher are properly credited. Please see the copyright policy on the journal website for more information.

REFERENCES

Edorium Journals: An introduction

Edorium Journals Team

About Edorium Journals
Edorium Journals is a publisher of high-quality, open access, international scholarly journals covering subjects in basic sciences and clinical specialties and subspecialties.

Invitation for article submission
We sincerely invite you to submit your valuable research for publication to Edorium Journals.

But why should you publish with Edorium Journals?
In less than 10 words - we give you what no one does.

Vision of being the best
We have the vision of making our journals the best and the most authoritative journals in their respective specialties. We are working towards this goal every day of every week of every month of every year.

Exceptional services
We care for you, your work and your time. Our efficient, personalized and courteous services are a testimony to this.

Editorial Review
All manuscripts submitted to Edorium Journals undergo pre-processing review, first editorial review, peer review, second editorial review and finally third editorial review.

Peer Review
All manuscripts submitted to Edorium Journals undergo anonymous, double-blind, external peer review.

Early View version
Early View version of your manuscript will be published in the journal within 72 hours of final acceptance.

Manuscript status
From submission to publication of your article you will get regular updates (minimum six times) about status of your manuscripts directly in your email.

Our Commitment

Six weeks
You will get first decision on your manuscript within six weeks (42 days) of submission. If we fail to honor this by even one day, we will publish your manuscript free of charge.

Four weeks
After we receive page proofs, your manuscript will be published in the journal within four weeks (31 days). If we fail to honor this by even one day, we will publish your manuscript free of charge and refund you the full article publication charges you paid for your manuscript.

Mentored Review Articles (MRA)
Our academic program “Mentored Review Article” (MRA) gives you a unique opportunity to publish papers under mentorship of international faculty. These articles are published free of charges.

Favored Author program
One email is all it takes to become our favored author. You will not only get fee waivers but also get information and insights about scholarly publishing.

Institutional Membership program
Join our Institutional Memberships program and help scholars from your institute make their research accessible to all and save thousands of dollars in fees make their research accessible to all.

Our presence
We have some of the best designed publication formats. Our websites are very user friendly and enable you to do your work very easily with no hassle.

Something more...
We request you to have a look at our website to know more about us and our services.

We welcome you to interact with us, share with us, join us and of course publish with us.

This page is not a part of the published article. This page is an introduction to Edorium Journals and the publication services.