

Amyand's Hernia: Report of Three Cases and Review of the Literature

Renato Pricolo*, Roberto Accordini, Vincenzo Casaburi, Francesca Abbiati, Angela De Leonardis and Luigi Percalli

Department of General Surgery, Codogno Hospital, Italy

*Corresponding author: Dr Renato Pricolo, U O di Chirurgia, Ospedale Civile di Codogno, Via Marconi 126845 Codogno, Tel: 3397767786; E-mail: renato.pricolo@libero.it

Received date: 28 Jan 2017; Accepted date: 28 Mar 2017; Published date: 03 Apr 2017.

Citation: Pricolo A, Accordini R, Casaburi V, Abbiati F, De Leonardis A, et al. (2017) Amyand's Hernia: Report of Three Cases and Review of the Literature. *J Surg Open Access* 3(3): doi <http://dx.doi.org/10.16966/2470-0991.152>

Copyright: © 2017 Pricolo A, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Amyand's hernia is a rare clinical condition. We report three cases of hernias containing a uninfamed appendix. Review of the literature includes an analysis of clinical symptoms, diagnostic findings, and therapeutic options.

Keywords: Amyand's hernia; Inguinal hernia; Acute appendicitis; Appendectomy; Acute abdomen

Introduction

Amyand's hernia is a very rare condition, accounting for about 1% of inguinal hernia repair cases. It was first described by Claudius Amyand in 1756. The findings of appendicitis or a perforated appendicitis in an inguinal hernia is even rarer, at about 0.1% of cases. We hereby report three cases of incidental appendectomy at the time of inguinal hernia repair. The review of the literature and management discussion is focused on providing support in surgical decision making for similar cases.

Case Report

Case 1

A 59 year-old male patient presented with a reducible right groin hernia. He had a history of hepatitis C infection, treated with Sofosbuvir and Simeprevir, with complete eradication of the virus. He also had a splenectomy during infancy for autoimmune thrombocytopenia. He had hypertension and hyperthyroidism. His height was 1.78 m and weight 74 Kg. The operative findings were of a right sliding hernia sac containing a portion of the cecum with a normal appendix. Appendectomy was done, followed by closure of the sac and hernia repair with mesh. Histology revealed chronic appendicitis. The patient did well and was discharged on the 4th postoperative day. At 1-year follow-up, there was no hernia recurrence.

Case 2

An 85 year-old male was admitted for the treatment of bilateral groin hernias, recurrent on the left side. His height was 1.68 m and weight 68 Kg. He had hypertension, chronic atrial fibrillation, and an atrophic left kidney from urolithiasis. A bilateral hernia repair was carried out, with findings of a normal appendix in the hernia sac on the right side. An appendectomy was done and the hernia repaired with mesh. Histology revealed chronic appendicitis. The patient did well and was discharged on 5th postoperative day. At 1.5-year follow-up, he had no recurrence.

Case 3

A 51 year-old male, otherwise healthy, was admitted for right groin hernia repair. His height was 1.60 m and weight 70 Kg. Intra operative

findings were of a normal appendix in the hernia sac. Appendectomy was done and the hernia repaired with mesh. The patient did well and was discharged on the 4th postoperative day. At 2-year follow-up, he had no recurrence.

Historical Background

The presence of vermiform appendix within an inguinal hernia was first described by Claudius Amyand in 1736 [1].

Claudius Amyand (1680-1740) was a French born, naturalized English surgeon, who became Warden and then Master of the Company of Barber-Surgeon. He was a pioneer of smallpox vaccination, Serjeant-Surgeon to Kings George I and George II, fellow of the Royal Society, first Principal Surgeon to the Westminster Hospital and a founder and first Principal Surgeon to St. George's Hospital. Amyand deserves to be recognized as the surgeon who performed the first recorded successful appendectomy [2].

On December 6, 1735, Amyand operated on Hanvil Anderson, an 11 year-old boy with an inguinal hernia and a fecal fistula draining in his groin. At the time of operation, a perforated appendix was found in the hernia sac and was excised. The operation lasted half an hour. The case was reported in the "Philosophical Transactions of The Royal Society" in 1736: "Tis easy to conceive that this operation was as painful to the patient as laborious to me" remarked Dr. Amyand [3]. The boy recovered from the fistula repair and appendectomy, but experienced a recurrence of the hernia.

Although this was the first reported case of "strange content of a hernia", Amyand's name didn't appear for a long time in the history of competition for "first successful appendectomy." The winner of this race was debated at length, with various case reports by different surgeons: Mestivier (1757), Parker (1843), Hancock (1848), Tait (1880), Groves (1883), Symonds (1883), Kronlein (1884), Hall (1886) Morton (1887) [2,4]. Mestivier, Parker and Hancock merely drained an appendiceal abscess, without actually doing an appendectomy. Lawson Tait probably was the first to remove an acutely inflamed appendix through an abdominal incision in 1880. Albeit through an inguinal incision, Amyand had in fact performed a successful appendectomy 150 years earlier.

Discussion and Conclusions

Amyand hernia is most frequent in men [5] and most of the cases are obviously right-sided, from the normal anatomical position of the appendix. Left-sided cases have been reported in patients with situs viscerum inversus, intestinal malrotation, a mobile cecum and an unusual appendiceal length [6,7]. In addition to the appendix, the hernia sac may also contain cecum, bladder, ovary, fallopian tube, omentum or Meckel's diverticulum [8,9]. The presence of an asymptomatic vermiform appendix in the hernia sac is reported in about 1% of all inguinal hernia repair cases, while acute appendicitis in an inguinal hernia is even rarer at about 0.13% [10,11], from 0,0008% to 1% in the English literature [12,13]. In 1937 Ryan reported 11 of 8692 cases (0.13%) of appendicitis in the inguinal sac [11]. Thomas reported only 7 cases of acute appendicitis occurring in an inguinal hernia in 8 years [14]. The average patient's age was calculated at 69.4 years, ranging from 3 weeks to 88 years [15].

The appendix found in the hernia sac could be inflamed and present as acute appendicitis. It is very difficult to discern whether visceral inflammation may be the primary process or a consequence of strangulation of the appendiceal vessels, leading to ischemia and necrosis [16]. Abu-Dalu suggest that the appendix may become more vulnerable to trauma inside a hernia and, if retained inside of the sac by adhesions, may become ischemic with resulting bacterial overgrowth and inflammation. Additionally, contraction of the abdominal muscles may increase intra abdominal pressure, causing compression of the appendix with worsening the inflammatory process [17]. Most cases present as an obstructed or strangulated hernias with or without an inflamed appendix [18,19]. Consequently, the diagnosis of Amyand's hernia is usually made intraoperatively. A preoperative ultrasonography or a computed tomography scanning could be helpful for the diagnosis but not a routine practice for this condition. Such imaging studies may show a thickened, blind-ended non compressible tubular structure with increased vascularity [5,20-22].

The differential diagnosis should include: strangulated hernia, strangulated omentocele, acute hydrocele, Richter's hernia, testicular tumor with hemorrhage, inguinal adenitis and epididimitis. Losanoff and Basson [1] proposed a classification and described the recommended management of Amyand hernia (Table 1).

If the appendix is normal, most authors recommend reduction of the hernia content into the abdomen and tension-free hernia repair, since a clean-contaminated appendectomy could lead to infectious complications with the use of mesh [1,21,23,24]. Others, who advocate incidental appendectomy, cite decreased future morbidity, mortality and cost, with no additional anaesthetic risks. In particular, for left-sided Amyand's hernias, an appendectomy may be considered to avoid problems of finding the appendix, should the need for appendectomy arise in the future [25].

Classification	Description	Surgical management
Type 1	Normal appendix within an inguinal hernia	Hernia reduction, mesh repairs Appendectomy in young patients.
Type 2	Acute appendicitis within hernia, no abdominal sepsis	Appendectomy through hernia primary repair of Hernia, no mesh
Type 3	Acute appendicitis within an inguinal hernia, abdominal wall, or peritoneal sepsis	Laparotomy, appendectomy, primary repair of hernia, no mesh
Type 4	Acute appendicitis within an inguinal hernia, related or unrelated abdominal pathology	Manage as type 1 to 3 hernia investigate or treat second condition as appropriate

Table 1: Classification of Amyand's hernia (Losanoff and Basson).

Nonetheless, the transition from a clean to a clean-contaminated operation can increase the infection rate as well as possible complications with use of prosthetic material [21,23]. Authors who advocate simultaneous appendectomy for appendicitis and hernia repair with mesh recommend 3-4 days of broad spectrum antibiotics [26,27].

In case of acute appendicitis with perforation and gross contamination, the appendectomy is mandatory but no prosthetic material should be used. A repair without prosthetic material (e.g. Shouldice repair) may be considered [28,29]. Other authors have proposed to approach the appendectomy not through an inguinal access but rather through laparotomy or laparoscopy [12,30]. However, in most cases, adhesions between the appendix and the hernia sac or the purulent content of the sac necessitate an inguinal approach.

The option of repairing the hernia with mesh and, at the same setting, a laparoscopic approach for the incidental appendectomy can be considered. The possibility of inducing appendicitis by handling the appendix has even been raised by some authors. Ofili reported 2 cases of appendicitis after Amyand's hernia repair and 11 cases of patients who had incidental appendectomies at the time of herniorraphy without wound infection and hernia recurrence [31].

On this controversial topic, our personal belief is that surgeons treating each individual patient should evaluate the pros and cons of each particular case and consider the options of inguinal appendectomy, hernia repair technique, mesh use and abdominal appendectomy with an open mind and rely on experienced surgical judgment in their decision making.

References

1. Losanoff JE, Basson MD (2007) Amyand hernia: what lies beneath-a proposed classification scheme to determine management. *Am Surg* 73: 1288-1290.
2. Creese PG (1953) The First appendectomy. *Surg Gynecol Obstet* 97: 643-652.
3. Amyand C (1736) Of an inguinal rupture, with a pin in the appendix caeci incrustated with stone; and some observations on wounds in the guts. *Phil Trans R Soc Lond* 39: 329-342.
4. Trombley S (1989) Appendicitis. In: Sir Frederick Treves: the extraordinary Edwardian. London, Routledge 52-76.
5. Ortega-León LH (2011) Hernia di Amyand: Presentación de un caso y revisión de la literatura. *Rev Med Hosp Gen Méx* 74: 98-100.
6. Bakhshi GD, Bhandarwar AH, Govila AA (2004) Acute Appendicitis in left scrotum. *Indian J Gastroenterol* 23: 195.
7. Khan RA, Wahab S, Ghani I (2011) Left-sided strangulated Amyand's hernia presenting as testicular torsion in an infant. *Hernia* 15: 83-84.
8. Nicola SM (2007) Hernia de Amyand: presentación de un caso y revisión de la literatura. *Rev Chil Cirugia* 59: 142-144.
9. Mahajan A, Pawar P, Luther A, Haque p (2014) Right sided Amyand's hernia. *J Coll Physicians Surg Pak* 24: 43-44.
10. Addiss DG, Shaffer N, Fowler BS, Tauxe RV (1990) The epidemiology of appendicitis and appendectomy in the United States. *Am J Epidemiol* 132: 910-925.
11. Ryan WJ (1937) Hernia of the vermiform appendix. *Ann Surg* 106: 135-139.
12. Carey LC (1967) Acute appendicitis occurring in hernias: a report of 10 cases. *Surgery* 61: 236-238.
13. D'Alia C, Lo Schiavo MG, Tonante A, Taranto E, Gagliano L, et al. (2003) Amyand's hernia: case report and review of the literature. *Hernia* 7: 89-91.

14. Thomas WE, Wowles KD, Williamson RC (1982) Appendicitis in external hernia. *Ann R Coll Surg Engl* 64: 121-122.
15. Cunha HA, Sugahara RD, Castilho MV (2009) Amyand's hernia. *Rev Col Bras Cir* 36: 279-280.
16. Weir CD, Doan SJ, Lughlin V, Diamond T (1994) Strangulation of the appendix in a femoral hernia sac. *Ulster Med J* 63: 114-115.
17. Abu-Dalu J, Urca I (1972) Incarcerated inguinal Hernia with a perforated appendix and periappendicular abscess. *Dis Colon Rectum* 15: 464-465.
18. Logan MT, Nottingham JM (2001) Amyand's hernia: A case report of an incarcerated and perforated appendix within an inguinal hernia and review of the literature. *Am Surg* 67: 628-629.
19. Livaditi E, Mavridis G, Christopoulos-Geroulanos G (2007) Amyand's hernia in premature neonates: Report of two cases. *Hernia* 11: 547-549.
20. Tsang WK, Lee KL, Tam KF, Lee SF (2014) Acute appendicitis complicating Amyand's hernia: imaging features and literature review. *Hong Kong Med J* 20: 255-257.
21. Michalinos A, Moris, Vernadakis S (2014) Amyand's hernia: a review. *Am J Surg* 207: 989-995.
22. Celik A, Ergun O, Ozbek SS, Documcu Z, Balik E (2003) Sliding appendiceal inguinal hernia: Preoperative sonographic diagnosis. *J Clin ultrasound* 31: 156-158.
23. Ivashchuk G, Cesmebasi A, Sorenson EP, Blaak C, Loukas M, et al. (2014) Amyand's hernia : a review. *Med Sci Monit* 20: 140-146.
24. Singal R, Gupta S (2011) "Amyand's hernia" - Pathophysiology, role of investigations and treatment. *Maedica (Buchar)* 6: 321-327.
25. Johari HG, Paydar S, Davani Sz, Eskandari S, Johari MG (2009) Left-sided Amyand herni. *Ann Saudi Med* 29: 321-322.
26. Torino G, Campisi C, Testa A, Baldassarre E, Valenti G (2007) Prosthetic repair of a perforated Amyand's hernia: hazardous or feasible? *Hernia* 11: 551-552.
27. Chatzimavroudis G, Papaziogas B, Koutelidakis I, Tsiaousis P, Kalogirou T, et al. (2009) The role of prosthetic repair in the treatment of an incarcerated recurrent inguinal hernia with acute appendicitis (infamed Amyand's hernia). *Hernia* 13: 335-336.
28. Samani RS, Hosseini SR, Shahmiri SS, Abedini L (2014) Amyand's hernia: an extremely rare condition of inguinal hernia accompanied with acute appendicitis. *Ann Colorectal Res* 2: e 17748.
29. Mahajan A, Pawar P, Luther A, Haque p (2014) Right sided Amyand's hernia. *Int Surg J* 1: 43-44.
30. Vermillon JM, Abernathy SW, Snyder SK (1993) Laparoscopic reduction of Amyand's hernia. *Hernia* 3: 159-160.
31. Ofili OP (1991) Simultaneous appendectomy and inguinal herniorrhaphy could be beneficial. *Ethiop Med J* 29: 37-38.