Lederhosen Hernia: First Description and Literature Review

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Abstract
Etymologically, hernia means “to protrude or to bud”. Abdominal wall hernias are frequent findings in adult and children imaging. Hernias are described by grading the size of their sacs as well as detailing their coverings and contents. Clinically, hernias are classified based on their reducibility, either by the experienced surgeon or by the patient, into reducible or irreducible. Pathologically, they vary in their potential to be obstructed, inflamed, or strangulated. A crucial part of managing any hernia is to interpret the imaging features in order to classify its type and assess for complications. Ultrasound (US), computed tomography (CT), and magnetic resonance imaging (MRI) are the most recommended imaging modalities. New generations of CT scans play an important role in elective and emergency hernia management. CT scans offer high reliability and sensitivity due to their easy accessibility, fast acquisition speed, higher resolution, and three-dimensional multiplanar reconstruction (3D-MPR). One of the most interesting aspects about hernias is their historically associated nomenclatures commonly published and used in medical education and surgical practice to specifically diagnose different hernia types. Those nomenclature terms (adjective or physician names), rather than anatomical regions, are by far the longest list of nomenclatures known to a single medical condition. Purposefully, the terms are essential for the identification of hernias by remembering and depicting their anecdotes. Similarly, the case presented here, supported by CT still/cine figures, introduces a new subtype of bilateral inguinal hernias where communicating hernial content and location are reminiscent of a “Lederhosen”.

Keywords Hernia · Abdominal pain · Bowel obstruction · CT scan

Case Presentation
A 97-year-old man presented with acute small bowel obstruction due to painful bilateral inguinal hernias, which were demonstrable both clinically and radiographically (Fig. 1). His medical history included chronic hernias, stroke, ischaemic heart disease, previous myocardial infarction, and osteomyelitis. On examination, his abdomen was distended and diffusely tender, most notably within the left inguinal region. Initial laboratory tests showed a normal white cell count of $9300 \times 10^9$/L (reference range $4000–11,000 \times 10^9$/L) and a raised C-reactive protein level of 25 mg/L (reference range 0–10 mg/L).

An urgent thin-slice computed tomography confirmed small bowel dilatation and right inguinal and left inguinoscrotal hernias (the level of transition at its average-size neck). Each hernia contained the ipsilateral bowel parts such that the caecum/appendix was visible within the right hernia (red arrows) and the distal ileal loops could be seen within the left hernia (white arrows). The terminal ileum (yellow arrowheads) crossed horizontally to connect both hernias and was enveloped in an outward pouch of the suprapubic inferior abdominal wall in a manner reminiscent of the “Hosentürl” front-flap typically associated with traditional “Lederhosen” (Fig. 2; cine clips of axial and coronal supplementary files).

The larger left inguinoscrotal hernia contained free fluid surrounding prominent small bowel loops with a mildly oedematous mesentery. No discernible features of bowel perforation, ischaemia, or pneumatosis intestinalis were seen.
The unique simultaneous arrangement of the hernial sac contents was perceived and interrogated with interest from the imaging perspective. However, given the marked frailty of the patient and his multiple cardiovascular comorbidities, he was deemed high risk for surgery and thus underwent a trial of manual hernia reduction, which was successful. The patient’s blood investigations and vital signs remained stable throughout admission, and he then returned to his nursing home with follow-up plans and without further complications.

Conclusions

Nowadays, the management of an acute abdomen includes the exclusion of complicated abdominal hernias. Enhanced CT scans offer numerous visualised anatomical details sufficient to delineate structural wall and bowel content within hernial sacs [1, 2]. Practically, clinicians and imaging specialists are required not only to detect the type and location, but also to further assess for potential complication and prognosis of hernias [3]. Therefore, in addition to conveying information on the location and content of hernias, referring to the applicable eponymous term could complement the reporting quality and signpost to an anticipated management plan, accordingly [1].

By reviewing literature, a comprehensive list of different eponymous types of hernia has been composed below (Table 1) [4–9]. In total, there are known 36 eponymous hernia types identified with the majority named after physicians, surgeons, anatomists, or pathologists. It is worthwhile mentioning that may be a handful eponyms are still known and taught in common surgical practice.

Interestingly, pantaloon hernia is described as an ipsilateral concurrent direct and indirect hernia, each bulging on either side of the inferior epigastric vessels [10]. Likewise, this reported case is another mimic to a clothing or costume item perceived to resemble the front-flap of a “Lederhosen”. Bilateral inguinal and inguinoscrotal hernias are not uncommon, but the unique combined arrangement of both hernial sac contents demonstrates a different peculiar appearance that equally warrants precise imaging interrogation and could benefit from a descriptive term for educational illustration.
| #  | Term (alphabetical order) | Description                                                                                                                                 |
|----|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Amyand’s                  | Appendix within the hernial sac                                                                                                             |
| 2  | Barth’s                   | Loops of the intestine between serosa of the abdominal wall and persistent vitelline duct                                                   |
| 3  | Béclard’s                 | Femoral hernia through saphenous opening                                                                                                |
| 4  | Berger’s                  | Hernia in pouch of Douglas (Cul-de-sac)                                                                                                  |
| 5  | Bochdalek                 | Congenital posterolateral diaphragmatic hernia                                                                                             |
| 6  | Busoga                    | Direct inguinal hernia caused by narrow defect in conjoint tendon or transversalis fascia, common in Busoga area of Uganda, South Sudan, and Ghana |
| 7  | Cloquet’s                 | Femoral hernia perforating the aponeurosis of the pectineus, lying therefore behind the femoral vessels                                    |
| 8  | Cooper’s                  | Femoral hernia with two hernial sac (bi-ocular femoral hernia)                                                                              |
| 9  | De Garengeot’s            | Appendix-containing incarcerated femoral hernia                                                                                            |
| 10 | Gibbon’s                  | Hernia with hydrocele                                                                                                                     |
| 11 | Gruber’s                  | Internal mesogastric hernia                                                                                                                 |
| 12 | Grynfeltt’s               | Hernia through Grynfeltt-Lesshaft triangle (superior lumbar triangle).                                                                        |
| 13 | Hesselbach’s              | Hernia of a loop of the intestine through the cribiform fascia presenting lateral to femoral artery                                          |
| 14 | Hey’s                     | Encysted scrotal or oblique inguinal hernia covered by three coverings of the peritoneum                                                   |
| 15 | Holthouse’s               | Inguinal hernia that has turned outward into the groin                                                                                      |
| 16 | Krönlein’s                | Partially inguinal and partially pre-peritoneal hernia                                                                                      |
| 17 | Larrey’s                  | Morgagni’s hernia                                                                                                                         |
| 18 | Laugier’s                 | Femoral hernia through gap in lacunar ligament, more medial in position and almost always strangulated                                      |
| 19 | Lederhosen                | Bilateral inguinal hernias connected across the abdomen by the terminal ileum whilst enveloped in suprapubic inferior abdominal wall bulge, like the front-flap found in the traditional costume “Lederhosen” |
| 20 | Littre’s                  | Hernia with Meckel’s diverticulum                                                                                                          |
| 21 | Lumbar                    | Lumbar region hernias: (1) Petit’s and (2) Grynfeltt’s                                                                                      |
| 22 | Malgaigne’s               | Abdominal wall muscle protrusion during leg raise test                                                                                      |
| 23 | Maydl’s                   | Hernia contains two loops of bowel arranged like a “W”                                                                                     |
| 24 | Morgagni                  | Retrosternal diaphragmatic hernia                                                                                                          |
| 25 | Mery’s                    | Perineal hernia protruding through pelvic floor muscles and fascia                                                                         |
| 26 | Narath’s                  | In congenital dislocation of the hip, hernia behind the femoral vessels                                                                     |
| 27 | Pantaloon                 | Ipsilateral concurrent direct and indirect hernia, each sac protrudes on either side (Pantaloon legs) of the inferior epigastric vessels       |
| 28 | Petersen’s                | Herniation of the small bowel through mesenteric defect from the Roux limb (bariatric gastric bypass)                                       |
| 29 | Petit’s                   | Hernia through inferior lumbar triangle (Petit’s triangle)                                                                                   |
| 30 | Phantom                   | Localised muscle bulge after muscular paralysis                                                                                             |
| 31 | Richter’s                 | Strangulated hernia involving one sidewall of the bowel                                                                                     |
| 32 | Rieux’s                   | Protrusion of intensive into a pouch behind the caecum (retrocaecal)                                                                       |
| 33 | Rokitansky’s              | Separation of muscular fibres of the bowel allow protrusion of a sac of the mucous membrane                                                |
| 34 | Serofini’s                | Hernia behind the femoral vessels                                                                                                          |
| 35 | Spigelian                  | Congenital or acquired defect in the spigelian fascia (transversus abdominis aponeurosis)                                                   |
| 36 | Treitz’s                  | Hernia into spaces/folds of posterior parietal peritoneum adjacent to ligament of Treitz (para-duodenal hernia)                             |
| 37 | Velpeau’s                 | Femoral hernia in front of the femoral vessels                                                                                              |
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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All images/cines prepared were anonymised prior to submission (courtesy of Nottingham University Hospitals NHS Trust). No personal or confidential patient data used in composing this report.

Informed Consent A publication consent was obtained from the patient’s next of kin.

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References

1. Toms AP, Cash CCJ, Fernando B, Freeman AH. Abdominal wall hernias: a cross-sectional pictorial review. Semin Ultrasound CT MR. 2002;23(2):143–55.
2. Toms AP, Dixon AK, Murphy JMP, Jamieson NV. Illustrated review of new imaging techniques in the diagnosis of abdominal wall hernias. Br J Surg. 1999;86(10):1243–9.
3. Murphy KP, O’Connor OJ, Maher MM. Adult abdominal hernias. AJR Am J Roentgenol. 2014;202(6):W506–11.
4. Alam A, Chander BN. Adult Bochdalek hernia. Med J Armed Forces India. 2005;61(3):284–6.
5. Malayeri AA, Siegelman SS. Images in clinical medicine. Amyand’s hernia. N Engl J Med. 2011;364(22):2147.
6. Chung A, Goel A. Images in clinical medicine. De Garengeot’s hernia. N Engl J Med. 2009;361(11):e18.
7. Liang TJ, Tsai CY. Images in clinical medicine. Grynfelt hernia. N Engl J Med. 2013;369(11):e14.
8. Seydel B, Detry O. Images in clinical medicine. Morgagni’s hernia. N Engl J Med. 2010;362(19):e61.
9. Chan DK. Images in clinical medicine. Obturator hernia. N Engl J Med. 2006;355(16):1714.
10. Mirilas P, Mouravas V. Enigmatic images: inguinal hernia of a ‘third kind,’ pantaloons hernia, ‘direct pantaloons’ hernia, or direct hernia and supravesical hernia? Hernia. 2010;14(3):333–4.

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