

Fat herniation through the canal of Schwalbe

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The authors report a case of fat herniation through the canal of Schwalbe noted in a female cadaver during abdominopelvic dissection. Perineal hernias are rare hernias, and herniations through the hiatus of Schwalbe represent a rare posterior lateral perineal hernia. While these hernias are extremely rare, anatomists and surgeons should be aware of them, and the clinical significance and manifestations which may occur with these hernias. (Folia Morphol 2014; 73, 4: 504–506)

Key words: hernia, perineal herniation, hiatus of Schwalbe

INTRODUCTION

The hiatus of Schwalbe arises as a tendinous gap between where the levator ani muscle attaches to the obturator internus fascia [3]. This hiatus plays a role of clinical significance as it may serve as a site for an extremely rare, lateral pelvic herniation of pelvic peritoneum into the ischiorectal fossae [7, 10, 12]. In addition, there is the pocket of Schwalbe which is defined as the depression between the arcus tendineus of levator ani and the pelvic wall; another potential site of hernias.

Herein, we present a rare case of herniation through the hiatus of Schwalbe discovered on routine anatomical dissection.

CASE REPORT

We present a case of fat herniation through the hiatus of Schwalbe in the left hemipelvis of a 68-year-old female cadaver (Fig. 1). The case was discovered incidentally during a routine anatomical dissection of the abdomen and pelvis at the University of Alabama at Birmingham during 2008. The cadaver did not show any other gross abnormalities or evidence of procedures involving the abdomen and the pelvis. The herniation was noted to be only adipose tissue and did not involve any bowel as it passed through the

hiatus between the levator ani and obturator internus fascia. As far of the authors' knowledge, the cadaver did not present with any symptomology related to the herniation during life.

DISCUSSION

Gustav Albert Schwalbe was a German anatomist (1844–1916), whose name bears on several structures such as the Schwalbe's convolutions (anterior occipital gyrus), Schwalbe's fissure (fissure choroidea), Schwalbe's nucleus (principal vestibular nucleus), Schwalbe's space (space of optic nerve), and Schwalbe's hiatus. Schwalbe is said to have described the hiatus as a pocket in the lateral pelvic wall, and called it "hiatus pelvici lateralis" [9].

Since its initial description, the hiatus of Schwalbe has been sparsely described in anatomical and clinical literature. However, when it is described by anatomists and clinicians, most state the hiatus acts as a site for lateral pelvic herniations where omentum, pre-perineal fat, or small bowel may herniate through the hiatus with increased peritoneal pressure [2, 12]. These lateral perineal herniations occur along the line of the origin of the levator ani muscle from the obturator internus fascia, known as the arcus tendineus, where the fascial structure may form a tendinous

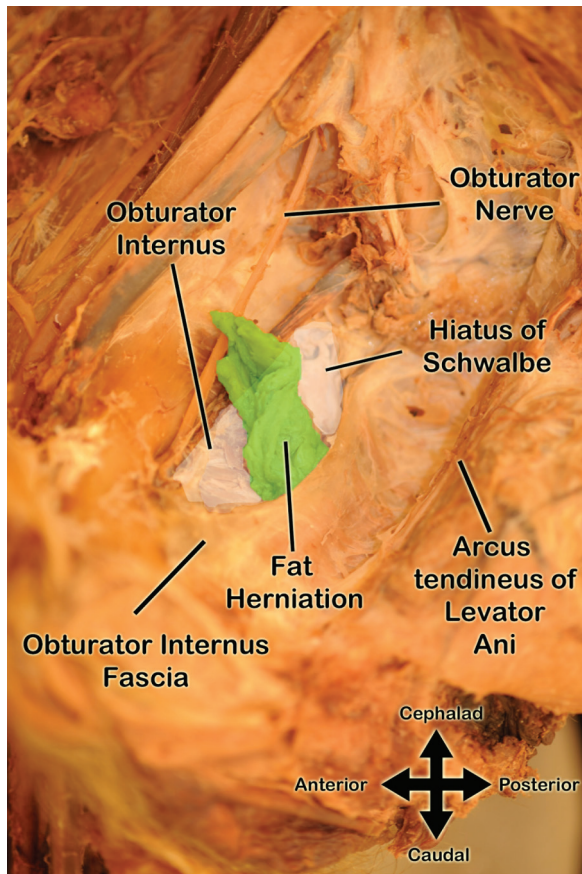


Figure 1. Fat herniation (highlighted in green) noted passing through the hiatus of Schwalbe (highlighted in white) in the left hemipelvis of a female cadaver. This herniation was asymptomatic in the cadaver during life, thus discovery was incidental on gross anatomical dissection.

sling [1, 7]. As a result, herniations may pass through this tendinous sling anteriorly into the labia majus or posteriorly into the ischiorectal fossa [1, 7, 10, 12].

The clinical significance of this hiatus is the presentation of perineal herniations, which present differently in males and females. Herniations through the hiatus are mostly noted as posterior lateral perineal hernias, with predominance in females. The hernias may be caused by congenital or acquired defects resulting in weakened pelvic floor [4]. Perineal hernias should be distinguished from rectocele or cystocele, which are more common, related to pelvic floor relaxation, and are not true hernias unlike perineal herniations [12]. Patients who have undergone abdominoperineal resections or perineal prostatectomies may be at risk of developing these perineal herniations [4].

These perineal hernias are noted to be lateral to the uterosacral ligament and posterior to the broad ligament in female patients [2], while in males, the

hernia emerges between the bladder and rectum in the perineum [12]. Herniations at the hiatus of Schwalbe tend to appear in two locations. The first site of herniation occurs as an upper posterior hernia between the pubococcygeus and iliococcygeus muscles, while the second location is seen as a lower posterior hernia, between the iliococcygeus and coccygeus muscles, lying inferior the lower margin of the gluteus maximus muscle [2, 3].

These herniations may be difficult to diagnose clinically [6]. Patients who have posterior lateral perineal hernias often complain of a soft protuberance between the gluteal muscles which reduces upon recumbency. The hernia can be palpated by rectal or bimanual rectal-vaginal examination [12]. Additionally, the diagnosis may be made on magnetic resonance imaging or computed tomography if the herniations are sizeable. When present in males, the herniations may only occur when a portion of the pelvic peritoneum gains enough tension and forces a peritoneal sac through the hiatus into the ischio-rectal fossa. In females, the herniation may occur in the ischio-rectal fossa, but can also be found lying in the posterior margin of the labium majus [1, 11, 12], inferior to the lower margin of the gluteus maximus muscle, or in close proximity to the vaginal wall [8]. Strangulation of small bowel is relatively uncommon with herniation through Schwalbe's hiatus. The hernia defects in relation to the hiatus may be large and the region surrounded by soft tissue and atrophied musculature, thus resulting in lower risk of strangulation [6, 12], though there have been case reports with sigmoid colon and ileum becoming incarcerated within the herniation [5].

Numerous previous case reports have discussed surgical treatments that can be applied to fix these posterior perineal hernias [11, 12]. These hernias may be repaired laparoscopically using a transabdominal, transperineal, or combined approaches to gain optimal visualisation of the pelvic cavity [2, 4]. Patients with postoperative perineal hernias should have repairs done with a transperitoneal approach as the presence of adhesions may obscure visualisation and make reduction difficult [12]. The contents of the hernia sac should be reduced along with a pre-peritoneal dissection to define the boundaries of the hiatal ring. Smaller defects may be closed with a primary repair utilising interrupted nonabsorbable suturing, but it is not advised as the surrounding pelvic floor tissues may be atrophic and unable to

provided support. Larger defects, and patients with weakened pelvic floors, require the use of nonabsorbable prosthetic meshes overlay on the defect.

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REFERENCES

1. Carter JE (2002) Sciatic, obturator, and perineal hernias: a view from the gynecologist. In: Fitzgibbons RJ, Greenberg AG. *Nyhus and Condon's Hernia*. 5th Ed. Lippincott Williams and Wilkins, Philadelphia, pp. 539–549.
2. Ely CA, Arregui ME (2003) Femoral and pelvic herniorrhaphy. In: LeBlanc KA. *Laparoscopic hernia surgery*. Oxford, New York, pp. 75–83.
3. Flament JB, Avisse C, Delattre JF (2001) Anatomy of the abdominal wall. In: Bendavid, R, Abrahamson J, Arregui ME. *Abdominal Wall Hernias*. Springer-Verlag, New York, pp. 63.
4. Malangoni MA, Rosen MJ (2012) Chapter 46: Hernias. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL eds. *Sabiston textbook of surgery*, 19th Ed. Saunders, Philadelphia, pp. 1137.
5. Rayhanabad J, Sassani P, Abbas MA (2009) Laparoscopic repair of perineal hernia. *JSLs*, 13: 237–241.
6. Singh K, Reid WMN, Berger LA (2001) Translevator gluteal hernia. *Int Urogynecol J*, 12: 407–409.
7. Skandalakis JE, Gray SW, Akins JT (1974) The surgical anatomy of hernial rings. *Surg Clin North Am*, 54: 1227–1246.
8. Skandalakis L, Gadacz TR, Mansberger AR (1996) Modern hernia repair. Parthenon Publishing, New York, pp. 302–314.
9. Smith GE (1908) Studies in the anatomy of the pelvis, with special reference to the fasciae and visceral supports. Part I, *J Anat Physiol*, 42:198–218.
10. Thorek P. (1985) Pelvic Diaphragms. In: Thorek P. *Anatomy in surgery*. 3rd Ed. Springer-Verlag, Berlin, pp. 572–577.
11. Zimmerman LM, Anson BJ (1967) *Anatomy and surgery of hernia*. William and Wilkins Co., Baltimore, pp. 353, 358–360.
12. Zinner MJ, Ashley SW (2007) *Maingot's abdominal operations*. McGraw-Hill Professional, New York, pp. 129.