Original Article

A Rare Cadaveric Finding of Direct Inguinal Hernia Containing Sigmoid Mesocolon

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Received: 14-01-2026; **Revised:** 28-02-2026; **Accepted:** 05-03-2026; **Published online:** 20-03-2026.

ABSTRACT

Introduction: Inguinal hernia is a frequently encountered condition in surgical practice; however, the occurrence of unusual contents within the hernial sac remains rare. Various intra-abdominal organs have been described as contents of the hernia sac; the rare ones include the appendix, ovaries, fallopian tubes, and urinary bladder.

Aims and Objectives: To study the occurrence and anatomical characteristics of direct inguinal hernia containing the sigmoid mesocolon in adult cadavers

Materials and methods: During routine anatomical dissection of twenty formalin-fixed cadavers, a direct inguinal hernia was identified in an approximately sixty-year-old male cadaver. The hernia was located on the left side, medial to the inferior epigastric vessels and contained sigmoid mesocolon along with adipose tissue.

Discussion: Although large bowel components are occasionally reported in sliding hernias, the presence of sigmoid mesocolon within a direct inguinal hernia is rare. Such anatomical variations are clinically significant, as unanticipated hernial contents may complicate surgical management and increase the risk of iatrogenic injury.

Result and conclusion: This study documents a rare anatomical finding and highlights its clinical relevance, particularly for surgeons performing inguinal hernia repair.

Keywords: Direct inguinal hernia; Sigmoid mesocolon; Cadaveric study; Anatomical variation; Inguinal region.

INTRODUCTION

The word "hernia" is from the Latin word "rupture"; the condition occurs when an organ normally contained in one body cavity protrudes through the lining of that cavity. Groin hernias have three components: the neck, which is the opening in the abdominal wall; the sac, which is formed by the protrusion of the peritoneum through the opening; and the contents — that is, any tissue or organ that protrudes through the neck into the hernia sac. The abdominal wall in the groin region is composed of the peritoneum, transversalis fascia, internal and external oblique muscles and their aponeurotic structures, subcutaneous tissue, and skin.

Groin hernias are inguinal or femoral; inguinal hernias are either direct or indirect. Both direct and indirect hernias protrude above the inguinal ligament; a direct hernia is medial to the inferior epigastric vessels, whereas an indirect hernia is lateral.[1]

In contrast to an indirect inguinal hernia, a direct inguinal hernia lies behind the spermatic cord. As the neck of the sac is wide, direct inguinal hernias do not often strangulate. Due to anatomical considerations, the sigmoid colon is commonly found to herniate through abdominal defects at the left inguinal region, especially as a sliding hernia.[2,3]

Various intra-abdominal organs have been described as contents of the hernia sac; the rare ones include the appendix, the ovaries, the fallopian tubes, and the urinary bladder. The contents are usually not looked for unless the hernia is irreducible, obstructed or strangulated. Hence, the true incidence of sigmoid colon or other intra-abdominal organs as a content of the sac will never be known.[4]

Aberrant collagen states, e.g. Ehler-Danlos Syndrome, Hurler and Hunter Syndromes, osteogenesis imperfecta, Marfan's syndrome, Alport's syndrome, etc. and undescended testis are associated with increased prevalence of inguinal hernias. Clinical conditions like ascites, constipation, obstructive uropathies, chronic obstructive pulmonary diseases, or chronic cough can also be associated with inguinal hernias.[5,6]

A significant association was demonstrated between COPD and direct inguinal hernia. Failure and herniation of the transversalis fascia could be a consequence of metastatic emphysema, analogous to emphysematous changes in the lungs. Metastatic emphysema was hypothesised as a mechanism for acquiring an inguinal hernia in adults[7]

Inguinal hernia in adult males is probably a multifactorial process. Strenuous physical activity, a positive family history of hernia, and the presence of COPD are significant association factors with primary inguinal hernia in adult males. A positive family history of hernia increases the likelihood of developing a primary inguinal hernia in an adult male by 8-fold.[8]

Aims and Objectives:

Aim: To study the occurrence and anatomical characteristics of direct inguinal hernia containing the sigmoid mesocolon in adult cadavers.

Objectives:

1) To identify cases of direct inguinal hernia and their contents.

2) To describe the anatomical features and relations of the hernial sac and its contents.

3) To emphasize the clinical and surgical relevance of this rare anatomical finding.

MATERIALS AND METHODS

The present study was carried out in the Department of Anatomy during routine undergraduate dissection. This study was conducted after obtaining approval from the Institutional Ethics Committee. Twenty formalin-embalmed cadavers were examined following standard dissection protocols. During exploration of the inguinal region in one male cadaver, estimated to be approximately sixty years of age, an inguinal swelling was identified on the left side. Primary markings of the Anterior Superior Iliac Spine (ASIS) and pubic tubercle were made, after which an incision was made 2.5 cm above and medial to the pubic tubercle. The skin was reflected up to the superficial fascia, and the anterior wall was carefully dissected to reveal the inguinal canal. The inguinal ligament and superficial inguinal ring were seen. A glistening hernial sac was observed and then opened. Careful layer-by-layer dissection was performed to determine the type of hernia and its contents.

RESULTS

Among the 20 adult cadavers examined, one male cadaver (5%), approximately 60 years of age, showed a direct inguinal hernia on the left side. The hernia protruded through the posterior wall of the inguinal canal medial to the inferior epigastric vessels, confirming its classification as a direct inguinal hernia (Fig. 1).

Figure 1: Dissection of the inguinal region showing the hernial sac protruding through the posterior wall of the inguinal canal and its relationship to surrounding structures within Hesselbach's triangle.

On opening the hernial sac, the contents were identified as sigmoid mesocolon with associated adipose tissue (Fig. 2). There was no compression of the blood vessels or spermatic cord. No evidence of prior surgical repair or scarring was noted.

The finding was incidental, identified during routine anatomical dissection.

The hernia measured approximately 8 × 3.5 cm and was found to be irreducible. The sigmoid mesocolon formed the sole content of the hernial sac, with no part of the sigmoid colon present. No similar findings were observed in the remaining cadavers studied.

Figure 2: Close-up view of the opened hernial sac demonstrating sigmoid mesocolon and adipose tissue as its contents.

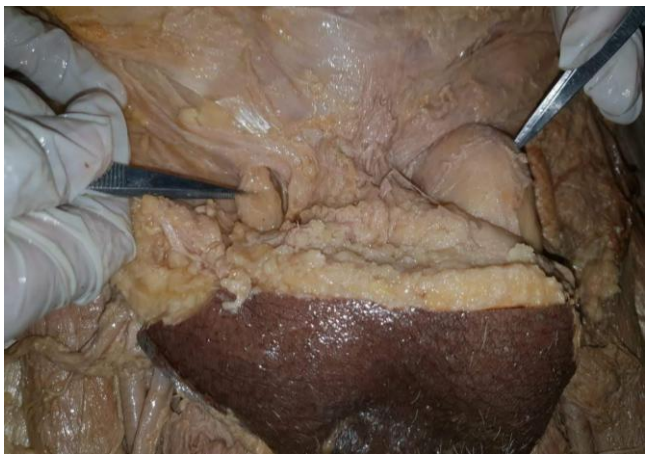

Figure 3: Detailed anatomical view highlighting the inguinal canal of both sides.

DISCUSSION

Golladay states that 10% of the population develops some type of hernia during lifetime.50% of the hernias are of the indirect inguinal variety, with a male-to-female ratio of 7:1. 25% are direct inguinal, 14% umbilical and 5% femoral hernia. The prevalence of all types of hernia increases with age.[5]

In a study conducted on 2,538 patients, by Cannon and Read, 1,455 (57.3%) had indirect defects and 1,075 (42.7%) had direct herniation. It was observed that the association between inguinal herniation and pulmonary disease was not only due to coughing, but represented a prolonged metastatic effect in the groin due to circulating proteases, which are generated in the lung and carried by pulmonary blood flow into the systemic circulation, producing metastatic lipolysis. Smoking was found to be a major contributing factor to this phenomenon.[7]

Aberrant collagen states, e.g. Ehler-Danlos Syndrome, Hurler and Hunter Syndromes, osteogenesis imperfecta, Marfan's syndrome, Alport's syndrome and undescended testis are associated with the prevalence of inguinal hernias. Clinical conditions like ascites, constipation, obstructive uropathies, chronic obstructive pulmonary diseases, chronic cough, smoking, lower body-mass index, high intra-abdominal pressure, collagen vascular disease, thoracic or abdominal aortic aneurysm, history of open appendectomy, and peritoneal dialysis can also be associated with inguinal hernias. [6,8]

Pooja G et al., reported in a 60-year-old male formalin fixed cadaver with bilateral indirect inguinal hernia with non-obstructed loops of omentum noticed within the hernial sac on the right side and non-obstructed loops of small intestine along with mesentery on the left side. On both sides, the contents entered the inguinal canal through the deep inguinal ring and passed out through the superficial inguinal ring, reaching the scrotum, thus confirming the diagnosis of indirect inguinal hernia.[12]

Allwyn J et al., reported a case of oblique inguino-scrotal hernia in a formalin fixed 70 year old male cadaver where the inguinal swelling was extending up to the scrotum on the right side with an enlarged superficial inguinal ring, thickened external spermatic fascia, hernia sac that contained a non-obstructed loop of transverse colon and greater omentum.[11]

In the present study, the content of the hernial sac was sigmoid mesocolon, with no coils of intestine or sigmoid colon.

In the study done by Chakraborty et al, the content of the hernial sac was sigmoid colon. In 2012, Pathak et al presented a very rare case of congenital inguinal hernia with sigmoid colon as its content.[3]

Upport et al stated in a case report that a 47-year-old man underwent colonic resection surgery of a 23cm long segment of perforated sigmoid colon following a road traffic accident; he had a six-month history of left-sided inguinal hernia, of which the loop of perforated sigmoid colon was the content.[10]

Bali et al in 2011 presented an extremely rare case of a strangulated right inguinal sliding hernia containing the sigmoid colon.[4]

In 2006, Gregory RS presented a case of colonic inguinal hernia in a 43-year-old man, where the content of the hernial sac was a loop of sigmoid colon with double constriction of the segment. According to him, a barium enema X-ray is to be done in such cases, followed by surgery. [9]

CONCLUSION

The present cadaveric study highlights the rare occurrence of the sigmoid mesocolon as a component of direct inguinal hernia. Although uncommon, such anatomical variations are of significant clinical importance, as unrecognised hernial contents may increase the risk of intraoperative complications during hernia repair. Awareness of this possibility can aid surgeons in careful dissection and better surgical planning. Cadaveric studies continue to play a vital role in documenting rare anatomical findings and enhancing the understanding of clinically relevant variations.

Acknowledgements

The authors sincerely acknowledge the body donors and the Department of Anatomy for enabling this study.

Source of Support: The author(s) received no financial support for the research, authorship, and/or publication of this article

Conflict of Interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

1) Fitzgibbons, R. J., & Forse, R. A. Groin Hernias in Adults. *New England Journal of Medicine*, 2015;*372*(8):756–763. https://doi.org/10.1056/nejmcp1404068

2) S. Williams N, Bulstrode, C. J. K, P. Ronan O'Connell. In: Bailey and Love's short practice of surgery; Hernias, Umbilicus and Abdominal wall. 25th edition; 2008.

3) Bali, C., Tsironis, A., Zikos, N., Mouselimi, M., & Katsamakis, N. An unusual case of a strangulated right inguinal hernia containing the sigmoid colon. International Journal of Surgery Case Reports, 2011;*2*(4):53–55. https://doi.org/10.1016/j.ijscr.2011.01.005

4) Pathak, N., Langer, V., & Rajagopalan, S. Sigmoid colon as a content of congenital inguinal hernia: A rare presentation. *Medical Journal Armed Forces India*, 2014;*70*(4):394–395. https://doi.org/10.1016/j.mjafi.2012.06.016

5) Golladay ES (September, 2000). Abdominal hernia; British Journal of Surgery; 57(9):1166.

6) CHAKRABORTY, P., MAJUMDAR, D. S., & GOSWAMI, A. K. Case Report: Sigmoid Colon as a Content of inguinal Hernia: 2023.

7) Cannon, D. J., & Read, R. C. Metastatic emphysema: a mechanism for acquiring inguinal herniation. *Annals of Surgery*, 1981;*194*(3):270–278. https://doi.org/10.1097/00000658-198109000-00004

8) Lau, H., Fang, C., Yuen, W. K., & Patil, N. G. Risk factors for inguinal hernia in adult males: A case-control study. *Surgery*, 2007;*141*(2):262–266.

https://doi.org/10.1016/j.surg.2006.04.014

9) Liu, S. H., Yen, C. H., Tseng, H. P., Hu, J. M., Chang, C. H., & Pu, T. W. Repair of a giant inguinoscrotal hernia with herniation of the ileum and sigmoid colon: A case report. *World journal of clinical cases*, 2023;*11*(2):401–407.

https://doi.org/10.12998/wjcc.v11.i2.401

10) Upport, R. N., Ghey, V. K., Gupta, R., & Gold, S. W. Intestinal perforation from blunt trauma to an inguinal hernia. *American Journal of Roentgenology, 2000;174*:1538. https://doi.org/10.2214/ajr.174.6.1741538

11) Allwyn Joshua, Vidyashambhava Pare, Roopa Sebastian. A Cadaveric exposure of an oblique inguinoscrotal hernia, Anatomy Journal of Africa; 2014;3(3):376- 379.

12) Dr Pooja Gangrade, Dr Surajit Kundu, Dr Dharam S. Rathia, M Ravikant Jatwar and M. Ravikiram. Greater Omentum without Torsion and Ileum with Mesentery as a content of Oblique Inguino-Scrotal Hernia: A Cadaveric case study. International Journal of Current Research in Life. 2015;4(3):162-167.

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