

Case Report

DOI: <https://dx.doi.org/10.18203/2349-2902.ijssurgery20254089>

Incidental finding of a polycystic and papillary tumor in a case of inguinal hernia repair and inguinal nerve entrapment: a case report

René G. Holzheimer^{1*}, Walter Nathrath², Clara Nathrath³, Petro E. Petrides⁴,
René H. Fortelny⁵, Nadey S. Hakim⁶

¹Department of Surgery, Ludwig-Maximilians University, Munich, Germany

²Department of Pathology, Landshut Hospital, Germany

³Department of Vascular Medicine, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

⁴Hematology Oncology Center and Ludwig-Maximilians University, Munich, Germany

⁵Sigmund Freud Private University, Vienna, Austria

⁶Cleveland Clinic London, London, UK

Received: 17 November 2025

Revised: 29 November 2025

Accepted: 01 December 2025

***Correspondence:**

Dr. René G. Holzheimer,

E-mail: rgholzheimer@t-online.de

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Groin pain is a common clinical complaint and is often misdiagnosed as an adductor strain or as pubic bone inflammation. While inguinal hernia repair is one of the most frequent surgical procedures, histological examination of the hernia sac is rarely performed. Tumors arising within the hernia sac are highly uncommon, making this case of mesothelioma particularly noteworthy. Herein this report presents the case of a 32-year-old White male athlete of European descent who presented with chronic left-sided groin pain. An open herniotomy was indicated due to a hernia and isolated nerve entrapment. Intraoperatively, a hernia and isolated nerve entrapment in the external oblique aponeurosis were confirmed. A cystic structure was discovered incidentally in the region of the hernia sac. The hernia sac and cysts were completely removed and sent for histological examination. Histologically, subepineurial edema and perineurial fibrosis of a nerve consistent with chronic injury were diagnosed, as well as a completely removed polycystic papillary mesothelial tumor in the region of the hernia sac. The case of inguinal mesothelioma illustrates the importance of histological examination, differential diagnosis, and interdisciplinary analysis in chronic groin pain. While routine histological examination of inguinal hernia sacs is not standard practice, specific intraoperative findings—such as non-intestinal contents, atypical tissue characteristics, unexplained clinical symptoms, recurrent hernias, or suspected malignancy—warrant histopathological evaluation to ensure comprehensive patient care. In cases of inguinal pain, establishing a causative differential diagnosis, such as ilioinguinal nerve entrapment and benign polycystic mesothelioma in the hernia sac, is of paramount importance for successful treatment.

Keywords: Inguinal hernia, Chronic inguinal pain, Ilioinguinal nerve entrapment, Inguinal hernia histology, Benign polycystic papillary mesothelioma, Case report

INTRODUCTION

Primary inguinal hernia repair is one of the most common surgical procedures. Chronic and acute groin pain is often associated with isolated nerve entrapment of the ilioinguinal nerve, leading to nerve compression neuropathy.¹ The differential diagnosis of groin pain

includes orthopaedic disorders (hip, impingement, adductors, lumbar spine), vascular (vein), and pelvic changes. Very rarely, benign multicystic peritoneal mesothelioma is the cause of groin pain. Even rarer is the occurrence of mesothelioma in the hernia sac and the simultaneous occurrence of nerve compression with isolated nerve entrapment. In these cases, histological

examination of the hernia sac may be necessary to establish the diagnosis, even in the absence of malignant changes.^{2,3}

CASE REPORT

A 32-year-old white male of European descent, active as a marathon runner and triathlon athlete, presented in early 2025 with a six-month history of chronic pain in the left groin. His medical history included a right inguinal herniotomy performed in 2022, followed by persistent postoperative discomfort. After ruling out impingement and involvement of the adductors or the hip, a color-coded duplex sonography revealed a reflux in the right greater saphenous vein, but no recurrent right inguinal hernia. However, under the Valsalva maneuver, a prolapse in the left inguinal canal and posterior wall insufficiency were present. There were no other external pathological findings. Laboratory findings were unremarkable.

Intraoperative findings

There was an isolated nerve entrapment of the anterior branch of the ilioinguinal nerve in the anterior wall of the left inguinal canal (aponeurosis of the *m. obliquus externus*). A tailored neurectomy has been performed. Part of the ramus anterior of the ilioinguinal nerve was sent for histological examination. We recognized a left indirect hernia and a posterior wall defect. The inguinal hernia sac has been severely cicatrized, presenting with cystic changes (Figure 1). Ligation and removal of the hernia sac were performed, followed by histological examination of the hernia sac.

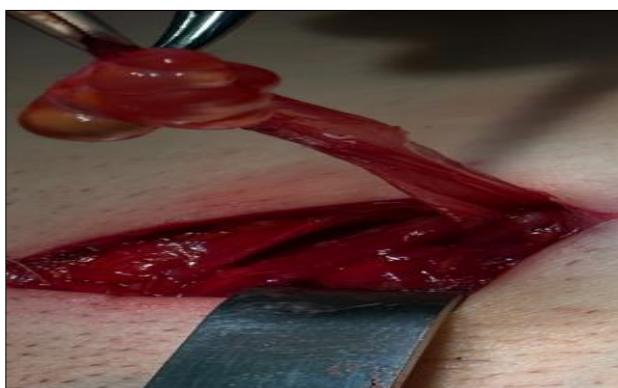


Figure 1: Polycystic mesothelioma in the male inguinal canal resembling an indirect inguinal hernia.

Histology

A well-differentiated polycystic and focally papillary mesothelial tumour, previously termed benign polycystic and focally papillary mesothelioma, was identified in the wall of the hernia sac. Histological examination revealed a neoplastic proliferation composed of multiple variably sized cysts, demarcated by fibrous septa (Figure 2). The cysts displayed a predominantly smooth inner surface,

with occasional singular luminal papillary projections. These structures were lined by a single layer of flattened mesothelial cells that appeared cytologically bland, without evidence of atypia, mitotic activity, or stromal invasion.

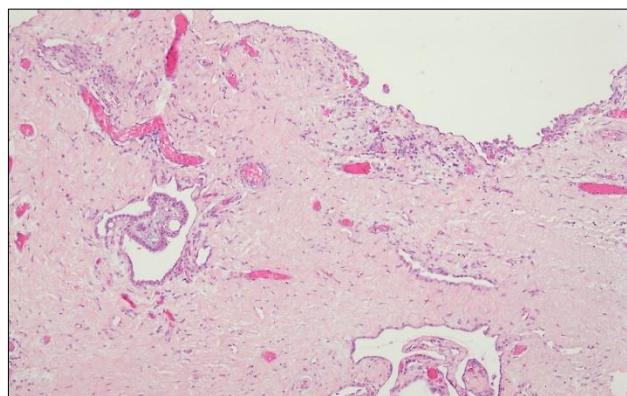


Figure 2: Many mesothelial-lined cysts with singular papillary formations.

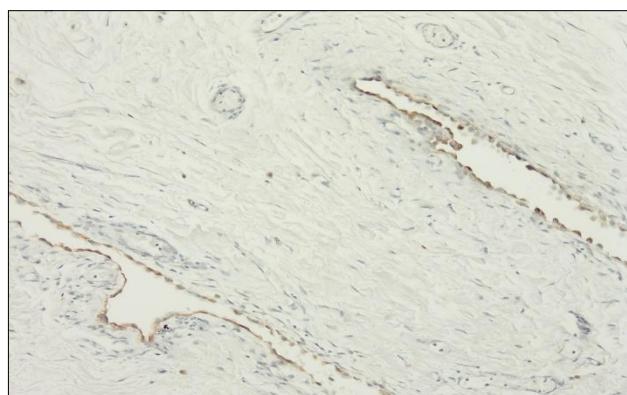


Figure 3: Cysts are lined by flattened bland mesothelial cells with characteristic immunohistological reactivity (here brown) for calretinin.

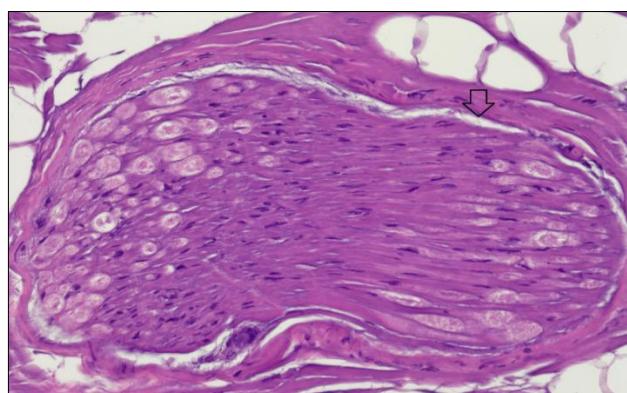


Figure 4: Nerve embedded in fibrofatty tissue with subepineurial oedema (arrow) and surrounding fibrosis.

Immunohistochemical staining demonstrated strong and specific expression of these cells for mesothelial markers, with diffuse positivity for calretinin (Figure 3), cytokeratins 5/6, and pan-cytokeratins (AE1/AE3). There was no immunoreactivity for CD34, effectively excluding vascular lesions such as cystic lymphangioma or cavernous hemangioma and confirming the mesothelial origin of the cyst-lining cells. In addition, sections of adipose tissue within the hernia sac wall exhibited reparative, scar-like changes. Notably, within these areas, large nerve branches were observed showing degenerative features, including subepineurial edema and perineural fibrosis (Figure 4).

No additional or separate lesions were identified.

DISCUSSION

Benign multicystic peritoneal mesothelioma (BMPM) may occur in various anatomical regions, including the inguinal canal. Imaging of pathological changes in the inguinal canal by ultrasound, CT, or MRI may help to establish a diagnosis. However, these techniques cannot definitively differentiate BMPM from other cystic lesions. "Nevertheless, malignant mesothelioma (MPM) often does not follow the golden rules in routine practice, while the literature generally does not sufficiently emphasize unusual features of its manifestation."⁴ Surgical removal is the treatment of choice. Complete excision improves outcomes.^{2,3,5,6}

Various pathological changes can cause chronic pain and require a careful examination of differential diagnoses.

Open anterior approach versus TAPP/TEP

In cases of chronic pain and ilioinguinal nerve entrapment at the anterior wall of the inguinal canal, the open anterior approach offers several significant advantages. The ramus anterior of the ilioinguinal nerve runs typically beneath or within the external oblique fascia. The open approach provides direct visualization and precise localization of the entrapped nerve. TEP and TAPP have been designed for mesh placement, where they yield good results; however, they may not be suitable for superficial nerve entrapment.^{7,8}

Differential diagnosis of chronic inguinal pain

The differential diagnosis of chronic groin pain includes, among others, inguinal hernia, athlete's hernia, ilioinguinal nerve entrapment, adductor strain, hip diseases, and, seldom, benign or malignant tumors.^{3,8,9}

Differential diagnosis of inguinal mesothelioma

Groin pain caused by inguinal mesothelioma, a very rare benign or malignant disease, may be associated with other primary or secondary malignancies. Because inguinal mesothelioma is rare, examination of the hernia sac is

particularly important for accurate diagnosis. The differential diagnosis depends on clinical findings, imaging studies, and histopathological examination.^{10,11}

Histological findings in nerve entrapment and irreversible nerve damage

Chronic compression of the nerve, combined with thickening and fibrosis of the perineurium and epineurium, can disrupt the blood supply and cause irreversible nerve damage and chronic pain. Chronic compression leads to thinning of the myelin sheath, a condition known as demyelination.¹²

Loss of nerve function is associated with axonal breakdown. This degeneration is often permanent and impedes nerve regeneration. Chronic inflammation within nerve tissue can cause permanent damage and hinder healing. Excessive collagen deposition leads to nerve scarring and impedes axonal healing. Scarring is the hallmark of irreversible nerve damage. Patients with preoperative pain may have intraneuronal fibrosis of the ilioinguinal nerve. The severity correlated with pain duration.¹³

Histopathological changes are essential for diagnosing and treating entrapment syndrome. Early intervention may prevent irreversible nerve damage. However, in the presented patient, the groin pain may also originate from the mesothelioma. Benign multicystic mesothelioma (BMM), a rare neoplasm, typically arises in the peritoneum and shows distinct histological changes significant for diagnosis (multiple cystic formations with mesothelial cell lining).

Histological features of benign multicystic mesothelioma

Histological features of BMM include cystic architecture, mesothelial cell coating, adenomatous or squamous metaplasia, an inflammatory stroma, and the absence of atypia and mitotic figures. "Separating benign from malignant mesothelial proliferations requires certainty that the process is mesothelial. While morphology is paramount, a supportive immunophenotype is necessary for a definitive diagnosis of mesothelioma." Immunohistochemical staining is crucial for confirming the tumor's mesothelial origin. It is essential to understand the nature of this disease, including its recurrence and multiple localizations. BMM, a rare tumor originating from mesothelial cells, is usually found in the peritoneum but can occasionally be found in the groin. It is multicystic and typically consists of a layer of cuboidal to squamous epithelial cells. Immunohistochemical staining shows positive reactions for calretinin and D2-40.¹⁴

Postoperative considerations

BMM is prone to recurrence, which can occur years after resection, even on the contralateral side. Differentiating BMM from other diseases, such as hydrocele or

incarcerated hernia, is challenging. Imaging techniques such as ultrasound or CT can help. Complete excision is the treatment. A herniotomy can be performed simultaneously if the BMM is confined to the groin. Individual characteristics—location and tumor size—are crucial. Histopathological examination with immunohistochemical staining is the cornerstone of diagnosis. The frequency and duration of follow-up examinations, including imaging, depend on the individual findings. Effective follow-up after an incidental diagnosis of benign polycystic inguinal mesothelioma should involve the patient, surgeon, pathologist, radiologist, oncologist, internist, and primary care physician.^{5,6}

Evidence supporting limited histological examination

Routine pathological examination of the hernia sac may increase procedure costs without improving clinical management. However, the incidental finding of benign polycystic mesothelioma during intraoperative evaluation underscores the need for histological evaluation.

This may include non-intestinal tissue in the hernia sac, atypical tissue structures, unexplained clinical symptoms, recurrent hernias, and suspicion of malignancy.¹⁵

Contribution to the field statement

Hernias represent the most common surgical procedure; typically, no tissue sample is taken for histological examination. In laparoscopic herniotomy, the hernia sac is usually left in situ. Benign and/or malignant tumors within the hernia sac are rare. This case represents the fourth PubMed-reported instance of benign mesothelioma arising in a hernia sac and the first case of ilioinguinal nerve entrapment together with benign mesothelioma causing groin pain. According to Prof. Fortelny, current guidelines—such as those of HERNIASURGE—do not yet address standardized management for tumors of the hernia sac. However, a clear recommendation for the intraoperative inspection of the hernia sac is warranted.

CONCLUSION

In summary, while routine histological examination of inguinal hernia sacs is not standard practice, specific intraoperative findings—such as non-intestinal contents, atypical tissue characteristics, unexplained clinical symptoms, recurrent hernias, or suspicion of malignancy—warrant histopathological evaluation to ensure comprehensive patient care. In cases of inguinal pain, establishing a causative differential diagnosis, such as ilioinguinal nerve entrapment and benign polycystic mesothelioma in the hernia sac, is of paramount importance for successful treatment.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Wright R, Born DE, D'Souza N, Hurd L, Gill R, Wright D. Pain and compression neuropathy in primary inguinal hernia. *Hernia*. 2017;21(5):715-22.
2. Oshikiri H, Ozawa Y, Suzuki O, Usuda M, Miyata G. Benign multicystic peritoneal mesothelioma occurring in bilateral inguinal canals metachronously: a case report. *Surg Case Rep*. 2022;8(1):44.
3. Cheng L, Lashmanova N, Reddy SB, Yan L, Gattuso P. Histopathological Findings in Hernia Sacs: A Clinical and Pathological Review. *Int J Surg Pathol*. 2024;32(2):310-5.
4. Rossi G, Davoli F, Poletti V, Cavazza A, Lococo F. When the Diagnosis of Mesothelioma Challenges Textbooks and Guidelines. *J Clin Med*. 2021;10(11).
5. Chakravarthy S, Singh JC, Jayamanne H, Shah V, Williams GL, Stephenson BM. Peritoneal mesothelioma masquerading as an inguinal hernia. *Ann R Coll Surg Engl*. 2011;93(6):e107-8.
6. Torretta A, La Torre V, Sorcini A, Panarese A, Tonini E, Zeri KP, et al. Peritoneal mesothelioma in a case of inguinal hernia. A review of the literature. *Ann Ital Chir*. 2003;74(5):583-7.
7. Holzheimer RG, Gaschütz N. Prophylaxis and treatment of acute and chronic postoperative inguinal pain (CPIP)-association of pain with compression neuropathy. *J Surg Case Rep*. 2020;2020(7):rjaa143.
8. Santilli O, Santilli H. Narrative review of long-standing groin pain in athletes. Retrospective analysis of over 12 000 patients. *Hernia*. 2025;29(1):81.
9. Wright R, Born DE, D'Souza N, Hurd L, Gill R, Wright D. Why do inguinal hernia patients have pain? Histology points to compression neuropathy. *Am J Surg*. 2017;213(5):975-82.
10. Teodoro M, Mannino M, Vitale M, Mattone E, Palumbo V, Fraggetta F, et al. Small bowel lymphoma presenting as inguinal hernia: case report and literature review. *World J Surg Oncol*. 2018;16(1):91.
11. Matsumoto G, Ise H, Inoue H, Ogawa H, Suzuki N, Matsuno S. Metastatic colon carcinoma found within an inguinal hernia sac: report of a case. *Surg Today*. 2000;30(1):74-7.
12. Wright R, Salisbury T, Landes J. Groin anatomy, preoperative pain, and compression neuropathy in primary inguinal hernia: What really matters. *Am J Surg*. 2019;217(5):873-7.
13. Narita M, Moriyoshi K, Yamaoka R, Moriyama M, Degawa K, Fushitani M, et al. Intraneuronal fibrosis within ilioinguinal nerve in inguinal hernia patients with preoperative pain: it's the sign of irreversible nerve injury, isn't it? *Langenbecks Arch Surg*. 2023;408(1):431.
14. Husain AN, Chapel DB, Attanoos R, Beasley MB, Brcic L, Butnor K, et al. Guidelines for Pathologic Diagnosis of Mesothelioma: 2023 Update of the Consensus Statement From the International

Mesothelioma Interest Group. Arch Pathol Lab Med. 2024;148(11):1251-71.

15. Wang T, Vajpeyi R. Hernia sacs: is histological examination necessary? *J Clin Pathol*. 2013;66(12):1084-6.

Cite this article as: Holzheimer RG, Nathrath W, Nathrath C, Petrides PE, Fortelny RH, Hakim NS. Incidental finding of a polycystic and papillary tumor in a case of inguinal hernia repair and inguinal nerve entrapment: a case report. *Int Surg J* 2026;13:88-92.