Case Report
Acta Medica Academica 2024;53(3):314-319
DOI: 10.5644/ama2006-124.455

A Round Ligament Mesothelial Cyst Imitating an Inguinal Hernia in a Woman of Reproductive Age

Christos Vrysis[1], Vasileios Gkatziolis[1], Nicole Demetriou[1], Konstantinos Geroulis[1], Rodanthi Mastrogianni[1], Alexandros Dais[1], Dimitrios Giovanitis[2], Marios Ponirakos[1], Konstantinos Papadimitropoulos[1]

[1]Second Department of Surgery, 251 Hellenic Air Force General Hospital, Athens, Greece, [2]Department of Pathological Anatomy, 251 Hellenic Air Force General Hospital, Athens, Greece

The study should be attributed to the Second Department of Surgery, 251 Hellenic Air Force General Hospital, Athens, Greece

Correspondence: *vryschri@hotmail.com*; Tel.: + 30 697 8458371

Received: 13 July 2024; **Accepted:** 16 September 2024

Abstract

Objective. A wide range of lesions, including a mesothelial cyst of the uterine round ligament, are included in the differential diagnosis of a groin mass. Our study emphasizes the rarity of this ailment and the significance of correct preoperative diagnosis in guiding our treatment approach. **Case Report.** A 43-year-old female patient, presented to our hospital with a five-year history of swelling and slight discomfort in the right groin. A nonreducible inguinal mass with greater projection during a Valsalva maneuver was found. An abdominal CT scan revealed a well-defined lesion located near the right horn of the uterus and extending through the inguinal canal. The patient was brought to the operating room with the clinical suspicion of an inguinal hernia. A soft mass measuring 4.5×2×1.8cm was discovered in the right round ligament, and it was surgically removed. Histopathological examination confirmed a mesothelial cystic lesion. The patient's condition, after a period of 12 months, continues to be satisfactory. **Conclusion.** Few cases of uterine round ligament mesothelial cysts have been reported worldwide. Their cause is unknown, and preoperative diagnosis is unreliable. Resection relieves symptoms, and histological examination of the surgical specimen confirms the diagnosis. Additional clinical cases are needed to create a systematic clinical approach.

Key Words: Round Ligament of the Uterus ▪ Mesothelial Cysts ▪ Inguinal Mass ▪ Inguinal Hernia ▪ Case Report.

Introduction

A mesothelial cyst of the round ligament is an uncommon developmental anomaly that is frequently linked to and mistakenly identified as an inguinal hernia (1). Multiple case reports have documented instances when a cyst was mistakenly diagnosed as a hernia in the groin area, herniation of the ovary, or malignant metastases (1-4). This clinical entity predominantly manifests in women of middle age, and tends to affect the right side (1).

This case report presents the hospital admission of a 43-year-old female patient due to the presence of a lump in her right inguinal region. Following surgery and histological confirmation, it was determined that our patient had a mesothelial cyst of the round ligament.

Case Presentation

A 43-year-old female gravida 2, para 2 patient, who had a swelling and slight discomfort in her right groin, presented to our hospital's surgical outpatient clinic. She had no known medical history and had not had any prior procedures. The inguinal lump appeared immediately after her most recent pregnancy, approximately five years before. As a result of this complaint, she had seen gynecologists and general surgeons numerous times since then, for both scheduled and emergency visits. She

received reassurances from everyone that her condition was an inguinal hernia.

On the basis of a physical examination, the skin covering the bulge appeared normal on physical examination. The patient did not experience any pain or sensitivity when the inguinal region was examined by palpation. The lump exhibited immobility, non-reducibility, and increased prominence during a Valsalva maneuver. No lump or discomfort was present in the opposite inguinal region. An assessment of the external genitalia revealed limited enlargement in the top and outer region of the right labia majora. Subsequently, an abdominal computed tomography was performed as an imaging test. The CT scan revealed a well-defined lump measuring 4.5x2cm. This lesion appeared to begin from the uterus and followed a path inside the right iliac vein, through the inguinal canal, and outside the rectus abdominis muscle, before ending in the subcutaneous fat (Figure 1, 2). Following the conclusion of the clinical and imaging evaluation, an open surgical excision of the right round ligament was planned for a few weeks later.

The patient was admitted to our clinic on the day preceding the procedure. Beyond the surgical issue, no concurrent diseases were discovered during the routine pre-operative examination. Initial optimization relies on a comprehensive history, thorough physical examination and laboratory studies. The patient underwent a bowel preparation, and was instructed to abstain from eating or drinking after midnight. During the surgical procedure, she was administered a single dose of antibiotic prophylaxis with 2 g of cefazolin intravenously. A right oblique inguinal incision was performed under general anesthesia. The superficial inguinal ring showed no abnormalities. The round ligament was abnormally enlarged. The entire right round ligament was carefully separated and removed. Upon examination, the deep inguinal ring showed no signs of an indirect hernia sac. The histologic investigation of the surgical specimen indicated the presence of a solitary layer of cuboidal cells that formed the lining of the cyst (Figure 2). These cells exhibited positive staining for calretinin and cytokeratin7 (Figure 3, 4).

After surgery, the patient was sent home on the fifth postoperative day, because of an initial occurrence of atrial flutter and the subsequent evaluation by cardiologists. At four-month follow-up, the patient's condition remained satisfactory and she reported a notably enhanced quality of life.

Discussion

Nearly 30-50% of mesothelial cysts of the round ligament of the uterus (MCURLs) are also accompanied by small inguinal hernias (1, 3, 5). The

Figure 1. Axial contrast enhanced abdominal CT scan. A right inguinal cystic and solid mass (yellow arrow).

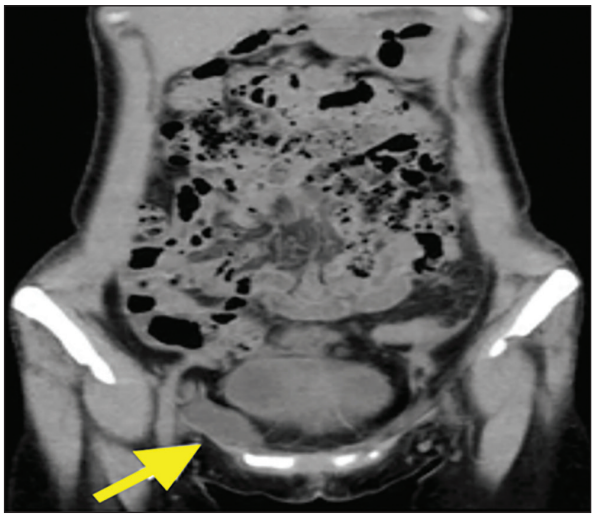

Figure 2. Coronal contrast enhanced abdominal CT scan. A well-circumscribed mass measuring 4,5×2cm (yellow arrow).

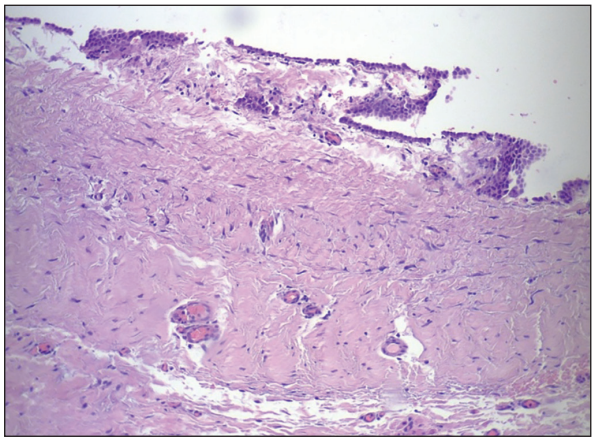

Figure 3. Histopathology of the surgical specimen. A cyst lined with a single layer of cuboidal cells (magnification 10×).

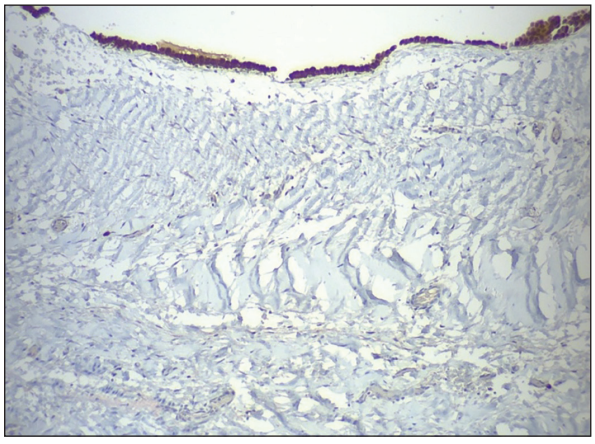

Figure 4. Immunohistochemistry of the surgical specimen. The cells stained diffusely positive for calretinin (magnification 10×).

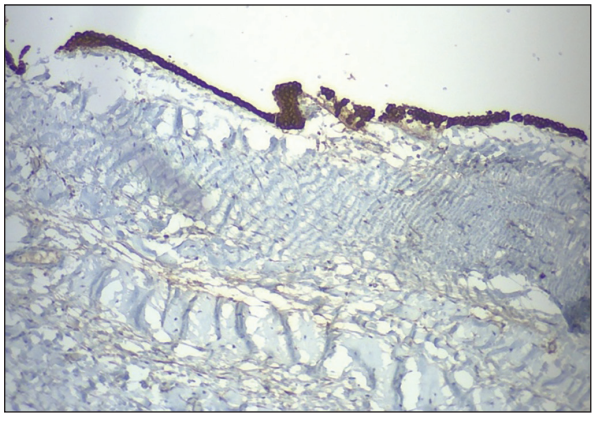

Figure 5. Immunohistochemistry of the surgical specimen. The cells stained diffusely positive for cytokeratin7 (magnification 10×).

etiology of MCURLs remains unidentified. There are three proposed theories regarding the development of MCURLs. The first theory proposes that MCURLs form when the mesothelium of the round ligament regenerates. The second theory suggests that MCURLs are a result of incomplete closure of Nuck's canal, leading to an MCURL that is essentially a cyst of Nuck's canal. The third theory proposes that MCURLs are created when embryonic, mesenchymal, and mesothelial components are incorporated during the formation of the round ligament (1-4, 6). The round ligament arises from the uterus, traverses the inguinal canal, and finishes at the region of the mons pubis and labia majora (7). From an anatomical perspective, this structure is the female equivalent of the gubernaculum testis. It consists primarily of smooth muscle fibers, connective tissue, blood vessels, and nerves, all of which are covered by a layer of mesothelial cells (8). The swelling of the inguinal region in females can be caused by various disorders, such as inguinal hernia, a tumor (lipoma, leiomyoma, sarcoma), a cyst, an abscess, lymphadenopathy, or hydrocele of the canal of Nuck (9).

Mesothelial cysts situated in the right lower quadrant can result in discomfort in the groin region, and exhibit clinical symptoms that resemble those of an inguinal hernia (1, 2, 4, 10, 11). Consequently, these conditions are frequently misinterpreted as groin hernias during the physical examination, and are only identified during the surgical procedure (4). When a person has a significant groin hernia, the surgeon may not be able to detect other issues during the procedure (11). These issues may only be identified after examining the removed tissue in a laboratory. To achieve an accurate preoperative diagnosis, it is essential to have a high level of suspicion and use imaging investigations (2).

Ultrasound is the preferred imaging technique, as it does not involve any radiation and is particularly safe for children and young women, who make up the majority of the affected population. This examination provides real-time information on intestinal peristalsis, vascular supply, and changes in size after coughing or the Valsalva

maneuver (6). Computed tomography shows the presence of a cystic mass with an uneven thickening of the wall and increased intensity of the solid areas when a contrast medium is injected intravenously. It is important to be cautious, to avoid incorrectly diagnosing the cyst as a metastatic site, especially when a primary tumor is found or when the patient has a history of cancer (3). Magnetic resonance imaging (MRI) is a costlier alternative that offers a higher level of detail regarding the surrounding anatomical structures. It is advisable only to use MRI in circumstances where the diagnosis is particularly challenging (12).

The diagnosis is established by means of histology. Our case findings suggested that the cyst was lined with a single layer of cuboidal cells that exhibit positive staining for calretinin, consistent with previous scientific publications (4, 5). After doing an extensive analysis of global literature from 1980 to 2024, we discovered that there are 35 reported cases pertaining to our particular ailment (1-6, 10, 13-17) (Table 1). The patient in our report like most in the PubMed, was under 50 years old and presented with inguinal pain but no menstrual cycle disorders. The cyst was located on the right side, consistent with the majority of cases in PubMed. Preoperative imaging included CT, but not ultrasound, which is the predominant imaging modality employed. The case was preoperatively diagnosed as inguinal hernia, which was also observed in 34% of PubMed cases. Notably, the patient underwent abdominal resection and did not have a coexisting inguinal hernia, a finding consistent with 13 cases in the literature. Laparoscopic resection, specifically TAPP (Trans Abdominal Pre-Peritoneal Repair), was used in 48% of cases.

The current research lacks adequate data to reliably recommend a specific therapy or follow-up plan. Given the benign nature of the condition, a prudent strategy would involve closely monitoring asymptomatic patients through regular ultrasound examinations. For cysts that exhibit symptoms or grow in size over time, surgical extraction is the recommended course of treatment (5). Considering the significant number of instances that utilized the TAPP procedure and the advantages of TAPP repair in comparison to open surgery, we assert that the TAPP treatment is likely the most efficacious method for eradicating MCURLs.

Table 1. The Characteristics of MCURLs in Our Case Report and Cases in PubMed

Characteristics	Our case report	Cases in PubMed (N=35)
		N; (%)
Age <50 years old	Yes	32 (91)
Symptom		
None	-	5 (14)
Inguinal pain	Yes	30 (86)
Menstrual cycle disorders	No	N/R
Location of the cyst		
Right-sided	Yes	22 (63)
Preoperative imaging		
U/S	No	21 60)
CT	Yes	12 (34)
MRI	No	3 (8)
Preoperative diagnosis		
Round ligament cyst	-	4 (11)
Inguinal hernia	Yes	12 (34)
Surgery method		
Abdominal resection	Yes	18 (51)
Laparoscopy resection	-	17 (48)
Coexisting groin hernia	No	13 (37)

N/R=Not referred; CT=Computed tomography; U/S=Ultrasonography; MRI=Magnetic resonance imaging.

Conclusion

When considering the causes of a female inguinal lump, it is important to account for the possibility of a mesothelial cyst of the round ligament. Female patients presenting with an irreducible mass in the groin region should undergo either sonographic or CT evaluation. Both the cyst and the round ligament should undergo surgical removal, as cysts that are not yet apparent within the round ligament have the potential to enlarge and result in symptoms. It is necessary to send all specimens collected during the process for pathology testing, as they may reveal any previously unnoticed pathological abnormalities.

What Is Already Known on This Topic:

Mesothelial cysts of the round ligament of the uterus commonly occur alongside small inguinal hernias in 30-50% of cases. The cause of MCURLs is still unknown. Mesothelial cysts located in the lower right quadrant can cause groin discomfort and present clinical signs that match those of an inguinal hernia. In order to obtain a precise preoperative diagnosis, it is crucial to maintain a high degree of suspicion and employ imaging investigations. Ultrasound is the primary modality for imaging, as it is non-ionizing. The diagnosis is determined through histological analysis. Surgical excision is the preferred treatment for cysts that show symptoms or increase in size over time.

What This Study Adds:

When examining the factors that contribute to the development of a lump in the female inguinal area, it is crucial to evaluate the potential presence of mesothelial cysts of the round ligament. The scarcity of recorded occurrences, along with a lack of suspicion, can lead to inaccurate preoperative diagnosis and treatment plans for the patient, as was the situation in our case. Female patients who have an irreducible mass in the groin area should receive either a sonographic or CT examination. Our study has a significant impact on the present understanding of the illness, due to the limited availability of studies that include imaging findings obtained by computed tomography. We have verified the previously documented findings on MCURLs, which indicate that they largely impact women in their middle age, predominantly manifest on the right side, and exhibit a significant rate of misdiagnosis. The existing evidence is insufficient to confidently suggest a particular treatment or course of action. We found that there are 35 documented instances related to our specific medical condition. This unequivocally illustrates the need to record more instances in order to improve our comprehension of the condition and establish a systematic approach to therapy.

Acknowledgements: The authors are immensely grateful to the patient for allowing utilization of her case data in this case report.

Authors' Contributions: Conception and design: MP, CV, KG and ND; Acquisition, analysis and interpretation of data: MP, ND, KG, DG and CV; Drafting the article: CV, MP, KG, ND and DG; Revising it critically for important intellectual content: VG, KP and DG; Approved final version of the manuscript: DG, VG and KP; All authors read and approved the final manuscript.

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

References

1. Harper GB Jr, Awbrey BJ, Thomas CG Jr, Askin FB. Mesothelial cysts of the round ligament simulating inguinal hernia. Report of four cases and a review of the literature. Am J Surg. 1986;151(4):515-7. doi: 10.1016/0002-9610(86)90116-9.
2. Tirnaksiz MB, Erkan A, Dogrul AB, Abbasoglu O. Mesothelial Cysts of the Round Ligament of the Uterus in 9 patients: A 15-year Experience. Int Surg. 2016;101(3-4):171-5. doi: 10.9738/INTSURG-D-15-00159.1.
3. Kim BM, Lee JY, Han YH, Kim SY, Seo JW, Kim YH, et al. Mesothelial cyst of the round ligament mimicking a metastasis: a case report. Korean J Radiol. 2010;11(3):364-7. doi: 10.3348/kjr.2010.11.3.364. Epub 2010 Apr 29.
4. Manatakis DK, Stamos N, Agalianos C, Vamvakas P, Kordelas A, Davides D. Mesothelial cyst of the round ligament misdiagnosed as irreducible inguinal hernia. Case Rep Surg. 2013;2013:408078. doi: 10.1155/2013/408078. Epub 2013 Sep 18.
5. Ryley DA, Moorman DW, Hecht JL, Alper MM. A mesothelial cyst of the round ligament presenting as an inguinal hernia after gonadotropin stimulation for in vitro fertilization. Fertil Steril. 2004;82(4):944-6. doi: 10.1016/j.fertnstert.2004.03.042.
6. Oh SN, Jung SE, Lee JM, Chung JH, Park GS. Sonographic diagnosis of a round ligament cyst in the inguinal area. J Clin Ultrasound. 2007;35(4):226-8. doi: 10.1002/jcu.20282.
7. Stickel WH, Manner M. Female hydrocele (cyst of the canal of Nuck): sonographic appearance of a rare and little-known disorder. J Ultrasound Med. 2004;23(3):429-32. doi: 10.7863/jum.2004.23.3.429.
8. Warshauer DM, Mandel SR. Leiomyoma of the extraperitoneal round ligament: CT demonstration. Clin Imaging. 1999;23(6):375-6. doi: 10.1016/s0899-7071(98)00021-7.
9. Choi YM, Lee GM, Yi JB, Yoon KL, Shim KS, Bae CW, et al. Two cases of female hydrocele of the canal of nuck. Korean J Pediatr. 2012;55(4):143-6. doi: 10.3345/kjp.2012.55.4.143. Epub 2012 Apr 30.
10. Saylam B, Gülseren MO, Han O, Comçali B, Vural V, Coşkun F. Cysts of the round ligament simulating inguinal hernia: report of a case. J Nippon Med Sch. 2013;80(4):296-9. doi: 10.1272/jnms.80.296.
11. Kershner D, Shapiro AL. MULTILOCULAR SEROUS CYSTS OF THE ROUND LIGAMENT SIMULATING INCARCERATED HERNIAE: REPORT OF THREE CASES. Ann Surg. 1943;117(2):216-20. doi: 10.1097/00000658-194302000-00008.
12. Ozel A, Kirdar O, Halefoglu AM, Erturk SM, Karpat Z, Lo Russo G, et al. Cysts of the canal of Nuck: ultrasound and magnetic resonance imaging findings. J Ultrasound. 2009 Sep;12(3):125-7. doi: 10.1016/j.jus.2009.05.002. Epub 2009 Jun 21.
13. Habibi M, Kazak M, Arioz Habibi H, Bulbuller N. A Rare Cause of Inguinal Mass: Round Ligament Cyst. Pol Przegl Chir. 2018;90(3):47-52. doi: 10.5604/01.3001.0011.6131.
14. Chen D, Zhang P, Zhang H, Guo M, Wang W, Zhang Z. Resection of mesothelial cyst of uterine round ligament by laparoscopic transabdominal preperitoneal procedure alone or combined with open surgery. J Int Med Res. 2019;47(11):5475-82. doi: 10.1177/0300060519865629. Epub 2019 Aug 5.

15. Liu J, Li K, Peng C, Zhang X. Mesothelial cyst of the round ligment uterine: A case report. Asian J Surg. 2023; 46(7):2870-1. doi: 10.1016/j.asjsur.2023.01.083. Epub 2023 Feb 17.
16. D'Orazio B, Corbo G, Martorana G, Di Vita G, Geraci G. Mesothelial cyst of the round ligament of the uterus A case report of a rare condition. Ann Ital Chir. 2020;9:S2239253X2003337X.
17. Apostolakis S, Ioannidis A, Koutserimpas C, Patrikakos P, Perrakis A, Velimezis G. Mesothelial cyst of the round ligament. G Chir. 2018;34(5):323-5.