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Mesothelial Cysts of the Round Ligament of the Uterus in 9 patients: A 15-year Experience

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The aim of this study was to evaluate the characteristic features of patients with mesothelial cyst of the round ligament of the uterus and the incidence of this entity. This was a retrospective review of 3065 patients who underwent inguinal exploration for groin mass from 1998 to 2013. Clinical, radiologic, and histopathologic features of patients with a diagnosis of mesothelial cyst of the round ligament were analyzed. Of the 405 female patients reviewed, 9 mesothelial cysts of the round ligament were identified (2.2%). The median age was 37 (range, 19–82 years). In all patients the groin mass was manually irreducible on physical examination. The lesions were on the right side in 6 (66.6%) patients. These were identified before surgery in 4 (all by groin ultrasonography). Three were misidentified as a hernia before surgery. The remaining 2 (22%) had both hernia and the mesothelial cyst of the round ligament. The cysts were identified after surgery at the time of histopathologic examination in these 2 patients. In all patients histopathologic examination revealed multilobular cystic lesion lined by a single layer of mesothelial cells. Cystic lesions arising from the round ligament were identified and excised along with the round ligament in 7 patients. In the remaining 2, a hernia repair was also performed. There was no recurrence at follow-up. Mesothelial cysts of the round ligament are rare. They are easily misidentified as groin hernia. An accurate diagnosis requires a high index of suspicion and is greatly aided by preoperative imaging studies.

Key words: Round ligament – Inguinal hernia – Cyst – Mesothelial cyst

True mesothelial cysts of the round ligament of the uterus (RLU) are rarely seen in women. They usually present as groin swellings and are frequently misdiagnosed as inguinal hernias. To date, published studies on this pathology are only case reports; no postmortem studies have been conducted to accurately find out the incidence of the round ligament cysts either; therefore, the actual

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Table 1 Patient demographics and clinical characteristics

	N (percent)
Patients	3065 (100)
Male	2660 (86.79)
Female	405 (13.21)
(Median/range)	52 (17–93)
Patients with mesothelial cyst of RLU	9 (2.2)
Age at diagnosis	
<40	5 (55.5)
40–49	2 (22.2)
50–59	1 (11.1)
60–69	0 (0)
70+	1 (11.1)
(Median/range)	37 (19–82)
Location of the cyst	
Right-sided	6 (66.6)
Coexisting groin hernia	2 (22.2)
Symptomatic	7 (77.7)
Duration of symptoms (month)	
<12	6 (66.6)
12–60	0 (0)
60–120	0 (0)
>120	3 (33.3)
(Median/range)	5 (1–480)
Preoperative imaging study	4 (44.4)
Preoperative diagnosis	
RLU cyst	4 (44.4)
Hernia	5 (55.5)

RLU, round ligament of the uterus.

incidence of this pathology is not known. We present our experience over the last 15 years with the 9 cases of mesothelial cysts of the RLU.

Patients and Methods

The records of all patients undergoing inguinal exploration for groin mass at the Department of General Surgery, Hacettepe University Faculty of Medicine from January 1998 to December 2013 were retrospectively reviewed. A total of 3065 patients were obtained. This represents a consecutive series. Symptoms, demographic data, operative notes, preoperative radiologic studies, and histopathology reports of the operative specimens of patients with perioperative diagnosis of round ligament cyst were collected and evaluated. Written informed consent was obtained from all patients prior to surgery.

Results

Of the total 3065 patients reviewed, 405 were female with a median age of 52 years (range, 17–93 years; Table 1). Nine (2.2%) of these patients were found to have a diagnosis of mesothelial cyst of the RLU (Table 2). The median age of the patients was 37 (range, 19–82 years). In all patients the groin mass was manually irreducible on physical examination. Six (66.6%) of 9 patients had right-sided round ligament cyst. In 4 patients, the diagnosis of the round ligament cyst was made before surgery on the basis of ultrasonographic and or computed tomographic appearance (Fig. 1); 3 of 9 patients with round ligament cysts were misdiagnosed as hernia before surgery. The remaining 2 (22%) had coexisting large groin hernia (1 inguinal, 1 femoral) on the same side and both patients suffered from groin hernia over 15 years. In these patients diagnosis was established postoperatively by the pathologic examination of the resected specimens. Of these 9 patients only 1 received previous ipsilateral groin surgery due to an indirect inguinal hernia. Five of the 7 patients with a round ligament cyst and no groin hernia presented with discomfort and vague pain in the groin area and the remaining 2 had sensation of heaviness and bulging. Median duration of the

Table 2 Clinical features of the individual patients

Case	Age	Side	Pain	Duration of symptoms (month)	Coexisting groin hernia	Previous surgery	Preoperative imaging study	Preoperative diagnosis
1	19	left	–	2	–	Ipsilateral inguinal exploration	USG, CT	RLC
2	44	right	+	240	–	None	USG	RLC
3	51	right	+	6	–	None	USG	RLC
4	36	right	+	1	–	None	None	IH
5	82	left	+	480	+	None	None	IH
6	48	right	+	180	+	None	None	IH
7	31	right	+	5	–	None	None	FH
8	37	left	+	6	–	Contralateral inguinal hernia repair	USG	RLC
9	23	right	–	1.5	–	None	None	IH

FH, femoral hernia; IH, inguinal hernia; RLC, round ligament cyst; USG, ultrasonography; CT, computerized tomography.

Fig. 1 Axial contrast enhanced CT shows right inguinal cystic mass (arrow).

symptoms was 5 months, ranging from 1 month to 40 years in these 7 patients.

Ultrasonography showed oval or fusiform, multilobular hypoechoic mass with no peristalsis in patients in whom a preoperative sonographic study was available. A stalk-like structure was also seen in one of the patients.

All patients underwent groin exploration under elective circumstances. Intraoperatively, cystic lesions originating from the round ligament were identified and excised along with the round ligament in 7 patients (Fig. 2). There was no intraoperative evidence of hernia in these patients. In 2 patients with groin hernia, hernia sac and the round ligament was excised and hernia repair was performed. Median duration of hospitalization was 1 day. All patients recovered uneventfully and remained without recurrence at follow-up 2 years postoperatively.

Histopathology examination of the operative specimens demonstrated multilocular cysts, lined with a single layer mesothelial cells in all patients (Table 3).

Discussion

Mesothelial cysts of the RLU are a rare entity. The largest series (4 cases) to date in English literature has been reported by Harper *et al* in 1986.[1] A search of the literature between 1986 and 2015 revealed only a further 10 reports.[2–11] We report a series of 9 true mesothelial cysts of the RLU, to our knowledge, the largest series published so far.

Mesothelial cysts of the RLU may present with groin symptoms and clinical findings indistinguishable from inguinal hernia. Consequently they are usually misdiagnosed as groin hernias during physical examination and identified only at the time of the surgery. They may even be missed intraoperatively in the presence of a coexisting huge groin hernia and be identified only during the pathologic examination of the resected specimen. A correct preoperative diagnosis requires a high index of suspicion and imaging studies. In our series, 4 of 9 patients were correctly diagnosed as round ligament cyst due to preoperative utilization of imaging studies.

A collective review of the literature shows that mesothelial cysts of the RLU have the clinical features as follows:[1,12,13] They are associated with clinically insignificant hernias in 30% to 50% of cases. The usual age of diagnosis ranges from 30s to 40s. Discomfort and vague pain, when present, are the predominant complaints. The bulging caused by the cyst is not reducible manually in most cases. In majority of cases, the cyst is on the right side. Clinical characteristics of our series were consistent with those described in the past literature in general except that in our series only 2 patients had associated groin hernias.

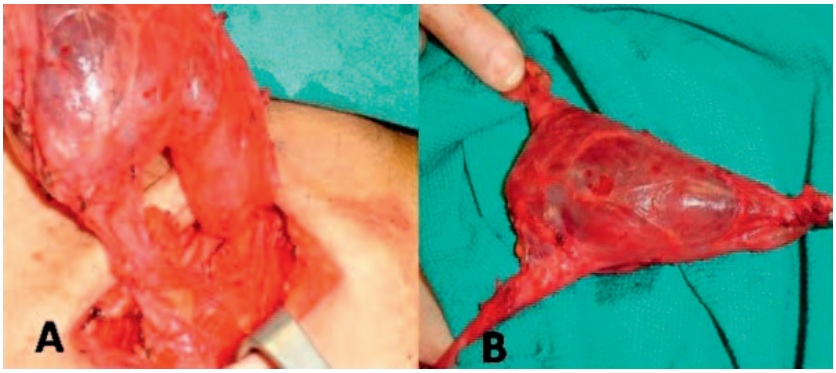

Fig. 2 (A) Intraoperative photograph of the mesothelial cyst originating from the round ligament. (B) Resected cyst and the round ligament.

Table 3 Pathologic findings of the patients

Patients	N (percent)
Histopathology	
Single layer of mesothelial cells	9 (100)
Cystic inclusions in the round ligament	2 (22.2)
Loculation	
Loculated	9 (100)
Size of the lesion (mm)	
	70 × 45 × 35
	35 × 15 × 10
	50 × 40 × 30
	40 × 20 × 15
	15 × 10 × 3
	15 × 10 × 7
	45 × 15 × 9
	40 × 30 × 10
	30 × 25 × 10
(Median/range) (largest dimension)	40 (15–70)

Ultrasonography is the imaging modality of choice in the assessment of groin masses. Ultrasonographic features of mesothelial cysts of RLU are not characteristic. They have various ultrasonographic findings on previously documented cases:[3,4,7,8,10,14] oval or fusiform shaped hypoechoic mass with internal septa, lobulated or loculated cystic mass, a stalk-like structure that connects the mass to the round ligament or inguinal canal, thickened wall, no peristalsis. In our series, the sonography of 4 patients showed similar findings to previously reported cases in the literature.

Pathogenesis of the mesothelial cysts of the RLU is not exactly known. Based on the embryologic development of the RLU and the pathologic features of the lesions, 2 theories have been suggested.[1] The first theory involves the failure of Nuck's canal to obliterate normally during the fetal development. Consequently, cysts may form at any point along the round ligament. This theory suggests that mesothelial cyst of RLU and Nuck's canal cyst (female hydrocele) are the same disorders. These 2 diseases have the same microscopic features and may have very similar clinical and radiologic characteristics. According to the second theory, cyst formation results from the inclusion of embryonic mesenchymal elements or remnants during the development of the RLU. Harper *et al* documented multiple small mesothelial cystic inclusions along the body of the round ligament. In our study we found these cystic inclusions in 2 patients. This finding along with the differences in the clinical features of Nuck's canal cyst and mesothelial cysts of the RLU support the latter theory. Nuck's canal cysts are more common in children, usually asymptomatic, unilocular under ultrasonographic examination and commonly on the left side;[15–17] whereas round ligament cysts are usually seen in middle-aged women, may be painful, tend to be multicystic and multilobular, and are usually found on the right side.

In males, spermatic cord cysts (not hydroceles) are found in less than 1% of inguinal hernia dissections.[18] In our study we found that 2.2% of all female inguinal explorations revealed a mesothelial cyst of the RLU, the female analog of inguinal cord cysts. Therefore this disorder is at least 2 times more common in women.

No postmortem studies have been made to accurately find out the incidence of the round ligament cysts. The lifetime incidence of inguinal hernia in females is 3%.[19] So the incidence of round ligament cysts can be estimated to be around 0.07%.

As a conclusion, although very rare, mesothelial cysts of RLU should be considered in the differential diagnosis of inguinal masses in women. A female patient who presents with an irreducible groin mass should undergo sonographic or CT evaluation. A cystic mass without peristalsis on ultrasonography supports this diagnosis. Not only the cyst itself but also the round ligament should be excised as not-yet-visible cysts found in the body of the round ligament may enlarge and become symptomatic. All specimens retrieved during the operation should be sent for pathology examination as they may reveal missed pathology as in cases 5 and 6. It should be noted that the popular laparoscopic approaches may easily miss these masses, since they are all found external to the transversalis fascia.[18]

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