A Rare but Noteworthy Diagnosis for “Lumps in the Groin” During Pregnancy: Round Ligament Varices

Jacelyn Hui Li Yeo 1
Sonam Tashi 2

Corresponding Author: Jacelyn Hui Li Yeo, e-mail: jacyeohuill@gmail.com
Financial support: None declared
Conflict of interest: None declared

Patient: Female, 35-year-old
Final Diagnosis: Round ligament varices
Symptoms: Painless right inguinal lump during second trimester of gestation
Medication: —
Clinical Procedure: —
Specialty: Obstetrics and Gynecology • Radiology • Surgery

Objective: Rare disease
Background: Round ligament varices (RLVs) are a rare entity that occurs almost only in pregnancy. Given its rarity and perhaps the lack of its awareness, it is not surprising that RLVs are often an overlooked differential diagnosis for inguinal swelling. Furthermore, this is aggravated by the fact that the clinical findings of RLVs on physical examination are usually non-specific and indistinguishable from the other more common causes of groin swelling.

Case Report: A 35-year-old Asian woman, gravidity 1 parity 0 presented at 26 weeks of gestation with a painless right inguinal lump. She was given a provisional diagnosis of “inguinal hernia.” Ultrasonography and color Doppler of the right inguinal lump showed echo-free tubular structures within the right inguinal canal, which became more prominent with Valsalva maneuver and demonstrated vascularity on color Doppler with a venous flow pattern, compatible with RLV. The patient was therefore reassured and treated conservatively. The symptoms spontaneously resolved after a few weeks postpartum.

Conclusions: With this case, we hope to increase the awareness of round ligament varices as an important differential diagnosis for an inguinal lump in pregnancy, and highlight the potential difficulty in making the diagnosis clinically. Ultrasonography can serve as a crucial investigation for the prompt and precise diagnosis of RLV, but more importantly, can be a safer alternative to invasive surgical exploration.

Keywords: Pregnant Women • Hernia, Inguinal • Round Ligament of Uterus • Ultrasonography • Varicocele

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/934313

1 Department of Diagnostic Radiology, Singapore General Hospital, Singapore, Singapore
2 Department of Vascular and Interventional Radiology, Division of Radiological Sciences, Singapore General Hospital, Singapore, Singapore

This work is licensed under Creative Common Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)
Background

Round ligament varix (RLV) is an uncommon but essential underlying etiology for groin lumps, occurring almost exclusively during pregnancy [1]. Although its exact incidence is unknown, it was reported to be about 0.13% (5/3816) in a case series by McKenna et al in 2008 [2]. Since it can present with similar symptoms and signs on clinical examination, indistinguishable from an inguinal hernia, the most common cause of groin swelling in the general population, RLV is generally misdiagnosed as a hernia. Its rarity and unfamiliarity compound this. These patients typically present with groin swelling, sometimes associated with pain. Occasionally, a history of dynamic changes in its size on Valsalva maneuver can also be obtained, making a clinical distinction between the two entities difficult. Other differentials to consider include lymphadenopathy, subcutaneous lipoma, soft tissue neoplasms, extra-genital endometriosis, mesothelial cysts, hydrocele of the canal of Nuck, vascular lesions like aneurysms, cystic lymphangiomas, and infective causes such as abscess formation [3,4].

Given its pathognomonic sonographic findings, RLV can be accurately diagnosed with ultrasonography [1,5,6], thus preventing the need for needless and invasive surgical exploration or intervention of the groin, which can result in potential risks/morbidity to the mother and the unborn child. Uncomplicated RLV can be managed conservatively and will undergo spontaneous resolution postpartum [2]. We report a case with RLV during pregnancy, which was promptly diagnosed with ultrasound and managed conservatively.

Case Report

A 35-year-old healthy Asian female, gravidity 1, parity 0 at 26 weeks of gestation, presented with a 2-week history of painless right inguinal lump. Her symptom had a gradual onset, with no particular history of obstructive gastrointestinal symptoms. She had no relevant past medical history, apart from a history of a previous right inguinal hernia about 20 years ago, which was managed conservatively.

On clinical examination, the skin overlying the lump was normal, with no redness or discoloration. The lump was soft, non-tender, non-mobile, and non-reducible with an equivocal cough impulse. It measured about 3×2 cm in size and appeared more prominent on Valsalva maneuver. No bowel sound or bruit was noted on auscultation. Examination of the contralateral inguinal region and the external genitalia were normal. No lower limb or vulvar varicosities were noted. She was referred to the general surgeon for surgical management by her attending obstetrician, who then referred her to the Radiology Department for an ultrasound of the inguinal region with a preliminary diagnosis of “inguinal hernia.”

Ultrasonography and color Doppler of the right inguinal lump were performed with an EPIQ 7 ultrasound system (Philips, Amsterdam, Netherlands). Grayscale sonography showed multiple echo-free serpiginous tubular structures within the right inguinal canal extending into the right para-uterine space, compatible with varicose veins (Figure 1). These tubular structures expanded with Valsalva maneuver (Figure 2) and demonstrated vascularity with venous flow on color Doppler (Figure 3). There was no ultrasonographic evidence of a right inguinal or femoral hernia.

Figure 1. Grayscale ultrasound and color Doppler ultrasound imaging of the right inguinal region. (A) Grayscale ultrasound imaging of the right inguinal region shows multiple echo-free serpiginous tubular structure structures within the right inguinal canal (arrowhead) extending into the right para-uterine space (arrow). (B) These structures demonstrate increased vascularity on color Doppler ultrasound with marked flow augmentation on Valsalva maneuver. There was no ultrasonographic evidence of an inguinal hernia. The imaging findings were consistent with round ligament varices (RLV).
hernia, lymphadenopathy, or soft tissue mass, nor were there signs of venous thrombosis or rupture. As the ultrasound findings were compatible with RLV, the patient was reassured and treated conservatively by the referring surgeon. The patient had a normal vaginal delivery at 39 weeks, and she reported spontaneous resolution of the lump during follow-up consultation about 8 weeks postpartum.

Discussion

The round ligament (also known as the ligamentum teres uteri) originates at the anterolateral aspect of bilateral uterine horns and is about 10-12 cm in length. It leaves the pelvis via the deep inguinal ring, passes along the inguinal canal, and terminates distally by breaking into several strands inserted into the labium majus. It consists principally of muscular tissue and some fibrous and areolar tissue and contains veins, arteries, lymphatics, and nerves [3,5,7,8].

Dilated plexus from veins draining the round ligament gives rise to round ligament varices (RLV), and pregnancy is considered a sine qua non for RLV development. The proposed mechanism includes:

- increased level of progesterone causing venous smooth muscle relaxation and therefore reduced venous tone and dilation
- increased cardiac output and hence venous return, leading to engorgement of venous tributaries,
- and most importantly, increased pelvic venous pressure from the gravid uterus [1,3,4,7].

RLVs most commonly present during the second trimester of gestation. Although there is no definite literature explaining why this is so, we believe that the hyperdynamic circulation during pregnancy, which peaks during the second trimester [9], along with the increase in pelvic venous pressure due to the
more pronounced increase in the gravid uterus size during this period leads to its manifestation. Postpartum presentation is also less common, and bilateral RLVs were previously reported in one-third of the cases [1].

Also, to date, there are no studies to definitively explain why only some pregnant women develop RLV. However, its underlying pathophysiology may be postulated from “pelvic congestion syndrome” (PCS), where women have pain and pelvic varicosities. Venous dilatation and congestion in PCS may develop due to multiple factors, including hypertension of the venous system, absent or incompetent valves with compromised antegrade blood flow, abnormally high levels of sex hormones due to underlying conditions like polycystic ovaries, which increase venous dilatation, anomalies of the draining pelvic veins, or genetic factors involved in the predisposition to varicose veins [10]. Other causes may include venous flow obstruction due to thrombosis or further extrinsic compression by pelvic masses like fibroids and neoplasms [10].

There are several differential diagnoses for inguinal swelling, of which an inguinal hernia is the most common. However, its reported incidence in pregnant women is significantly lower, at less than 0.12% [11]. RLV is often conveniently and prematurely misdiagnosed as an inguinal hernia due to its rarity and similarity in clinical presentation with a hernia, which is more commonly diagnosed in the general population. Both conditions present with swelling and discomfort in the groin, which can be provoked by increased intra-abdominal pressure such as coughing or weight lifting. The findings on physical examination are also very similar as both veins and hernial sac accompany the round ligament in the inguinal canal. Furthermore, RLV can be reducible or irreducible compared to a hernia due to the valveless nature of the round ligament varicosities, leading to incomplete emptying. Similar to the inguinal hernia, there is a positive cough impulse with RLV, as increased abdominal pressure with cough results in venous distension [1,2,5].

Findings of coexisting varicosities in the lower limb or vulva should prompt a diagnosis of a RLV [3,6]. However, the absence of these extra-abdominal varicosities does not exclude a RLV diagnosis [3], as demonstrated in our case report.

Besides PCS, much rarer diagnoses such as venous anomalies of the ovarian vein and inferior vena cava (IVC) like IVC agenesis [12] and drainage of the right ovarian vein into the right renal vein (instead of IVC) [13] can be considered. Having said that, to the best of our knowledge, these very rare entities show no predisposition to pregnancy in contrast to RLV.

Ultrasound examination can accurately diagnose RLV and exclude an inguinal hernia and other differential diagnoses such as lymphadenopathy, subcutaneous lipoma, soft tissue neoplasms, extra-genital endometriosis, and cystic lymphangiomas [1,2,8]. The scan is performed with the patient placed in a supine position and instructed to carry out Valsalva maneuvers. Color and Doppler imaging should also be utilized [2]. The characteristic grayscale ultrasound appearance includes a mesh of engorged venous plexus and the appearance of the classical “bag of worms” [1,3]. Color Doppler ultrasound should demonstrate a “venous flow pattern” with dilatation and increased flow on Valsalva maneuver [1,2].

After confirming the diagnosis of RLV, reassurance with a “wait-and-see” policy is justified due to the evanescent nature of the entity during pregnancy. Spontaneous resolution of the RLV will occur in most patients postpartum after the pelvic venous engorgement caused by the gravid uterus is relieved [2,6,8].

Nevertheless, close monitoring, especially during the peripartum period, is recommended, as rupture and acute variceal thromboses of the varices have been reported [14]. This is especially so if pain becomes the predominant symptom. Due to the rarity of this condition, no specific guidelines or recommendations on the frequency or interval for follow-up imaging or consensus on how to manage such complications is available in the current literature. However, a low threshold to repeat imaging in patients with new-onset symptoms suggestive of complications or a more frequent review for those with persistent pain in which complications were previously ruled out are suggested. In these circumstances, ultrasonography again plays an indispensable role in ruling out these complications of RLV [2,7]. Alternatively, an MRI or CT can be considered, with MRI being the favored modality if the patient is still pregnant, and CT for postpartum cases [7].

Failure of the RLV to resolve spontaneously in the postpartum period warrants further investigation with CT or MR angiography/venography for a complete examination of the pelvic anatomy to exclude other compressive masses or abdominopelvic venous anomalies which may have predisposed the patient to the development of pelvic varicosities during pregnancy [10].

Conclusions

With this case report, we hope to increase the awareness of round ligament varices as an important differential diagnosis for an inguinal lump in pregnancy and highlight the potential difficulty in making the diagnosis clinically. Lastly, we emphasize the importance of ultrasound examination for making a precise and prompt diagnosis of RLV so that unnecessary surgical exploration and its associated risks can be circumvented.
References:

1. Ryu KH, Yoon J-H. Ultrasonographic diagnosis of round ligament varicosities mimicking inguinal hernia: Report of two cases with literature review. Ultrasonography. 2014;33(3):216-21

2. McKenna DA, Carter JT, Poder L, et al. Round ligament varices: Sonographic appearance in pregnancy. Ultrasound Obstet Gynecol. 2008;31(3):355-57

3. Ijpma FFA, Boddeus KM, de Haan HH, van Geldere D. Bilateral round ligament varicosities mimicking inguinal hernia during pregnancy. Hernia. 2009;13(1):85-88

4. Lee DK, Bae SW, Moon H, Kim YK. Round ligament varicosities mimicking inguinal hernia in pregnancy. J Korean Surg Soc. 2011;80(6):437

5. Naik SS, Balasubramanian P. Round ligament varicose inguinal hernia during pregnancy. Radiol Case Rep. 2019;14(8):1036-38

6. Cheng D, Lam H, Lam C. Round ligament varices in pregnancy mimicking inguinal hernia: An ultrasound diagnosis. Ultrasound Obstet Gynecol 1997;9(3):198-99

7. Ng C, Wong GT. Round ligament varicosity thrombosis presenting as an irreducible inguinal mass in a postpartum woman. J Clin Imaging Sci. 2019;9:28

8. García-Paredes LF, Torres-Ayala SC, Rivera-Hernández W, Rodríguez Mojica W. A case of round ligament varices presenting in pregnancy. Am J Case Rep. 2017;18:1194-97

9. Hunter S, Robson SC. Adaptation of the maternal heart in pregnancy. Br Heart J. 1992;68(6):540-43

10. Phillips D, Deipolyi AR, Hesketh RL, et al. Pelvic congestion syndrome: Etiology of pain, diagnosis, and clinical management. J Vasc Interv Radiol. 2014;25(5):725-33

11. Oma E, Bay-Nielsen M, Jensen KK, et al. Primary ventral or groin hernia in pregnancy: A cohort study of 20,714 women. Hernia. 2017;21(3):335-39

12. Singh SN, Bhatt TC. Inferior vena cava agenesis: A rare cause of pelvic congestion syndrome. J Clin Diagn Res. 2017;11(3):TD06-08

13. Karaosmanoglu D, Karcaaltincaba M, Karcaaltincaba D, et al. MDCT of the ovarian vein: normal anatomy and pathology. AJR Am J Roentgenol. 2009;192(1):295-99

14. al-Qudah MS. Postpartum pain due to thrombosed varicose veins of the round ligament of the uterus. Postgrad Med J. 1993;69(816):820-21