

Manuscript ID  
DOIZUMJ-2009-1932 (R1)  
10.21608/zumj.2020.41329.1932

## ORIGINAL ARTICLE

### Inguinal Swelling During Pregnancy, How to Manage?

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Submit Date 2020-09-07

Revise Date 2020-09-11

Accept Date 2020-09-21

#### ABSTRACT

**background:** inguinal hernia in females is rare. At the time of pregnancy, a rare condition can evolve, round ligament varicosities, which is difficult to differentiate for the inguinal hernia on clinical bases. Ultrasonography with Doppler study differentiates the two conditions. Round ligament varicosities disappear spontaneously after delivery, while inguinal hernia needs surgical repair. This study aimed to highlight a cause of groin swelling in females during pregnancy, round ligament varicosities, and the feasibility of inguinal hernia repair during the elective cesarean section.

**Patients and methods:** A prospective study of 17 pregnant patients presented with inguinal swelling. Ultrasonography was the cornerstone investigation for these patients that revealed round ligament varicosities in most patients and only four inguinal hernia cases. Patients with round ligament varicosities managed conservatively. Patients with hernia offered to repair the hernia during the cesarean section.

**Results:** 17 pregnant patients presented with reducible inguinal swelling with impulse on cough. Most patients 14/17 presented with inguinal swelling without pain, while 3/17 patients had inguinal swelling and pain. The total patients with inguinal hernias were 4 patients; two of them were diagnosed before the occurrence of the pregnancy, and two patients during pregnancy. Thirteen patients with inguinal swelling had round ligament varicosities by ultrasound examination.

**Conclusion:** The diagnosis of an inguinal hernia depending on the clinical picture only during pregnancy may be misleading in most cases. Concomitant preperitoneal inguinal hernioplasty with cesarean section is feasible.

**Keywords:** inguinal swelling, round ligament varicosities, inguinal hernia.



#### INTRODUCTION

Groin mass during pregnancy is rare. The most common differential diagnoses of a groin mass include inguinal hernia and round ligament varicosities [1].

Gradual onset of inguinal tenderness and reducible swelling in the groin in women can be a first-ever manifestation during pregnancy [2,3].

Round ligament varicosities can easily be mistaken as an inguinal hernia. The diagnosis of round ligament varicosities can be established sonographically [4]. There are many case reports of surgical interventions of the inguinal region for suspected groin hernia during pregnancy [1,5].

Combined surgical procedures can be a modality of choice for improving cost. These patients require

single hospital admission, one preoperative evaluation, one-time anesthesia, and do not have a longer operative time, hospitalization time, and convalescence periods than two separate surgeries [6,7].

#### MATERIAL AND METHODS

A prospective clinical study from September 2016 to December 2019, 17 pregnant patients presented with inguinal swelling presented at the outpatient clinic at the Surgery Department at Zagazig University Hospitals.

Written informed consent was obtained from all participants, the study was approved by the ethical committee of Faculty of Medicine, Zagazig University. The study was done according to The

Code of Ethics of the World Medical Association for studies involving humans.

All patients were clinically examined by taking history and examination of the inguinal region and investigated by inguinal ultrasound, grey-scale, and color Doppler. The ultrasound revealed an inguinal hernia in some cases but round ligament varicosities in the majority.

The condition had been discussed with each patient. The patients whom the ultrasound revealed round ligament varicosities just follow up. Patients with round ligament varicosities and pain received paracetamol. The varicosities were disappeared after labor in two to three weeks. Patients who were diagnosed to have an inguinal hernia offered to operate on the hernia either after their labor or at the time of delivery with the cesarean section. The patients prefer to operate on the hernia at the time of the cesarean section.

The hernia repair started after the delivery of the baby and closure of the peritoneum. The preperitoneal space was entered by retracting the rectus muscle upward and separate the peritoneum from it, and the preperitoneal space was dissected laterally, exposing the internal inguinal ring. At the level of Pfannenstiel incision, there is no posterior rectus sheet, so retraction of the rectus abdominis muscle enabled us to access directly the preperitoneal space, Retzius space then the space of Bogros.

After dissecting the hernial sac from the inguinal canal and the round ligament, traction on the round ligament, and dissecting it distally from the inguinal canal (figure 1) then, it is clamped and ligated. polypropylene mesh (10x10 cm) (figure 1S) was applied to cover the hernia defect and fixed to Cooper's ligament and the upper edge of the mesh was fixed to the anterior abdominal wall by polypropylene 2/0 suture. No stitches were taken at the lower part of the mesh to prevent neurological and vascular injuries.

After the fixation of the mesh, the two recti were approximated by interrupted vicryl® 2/0 stitches then closure of the anterior rectus sheath by continuous vicryl® 0 stitch. The skin edges should be closed with a subcuticular stitch.

**Statistical analysis:**

Statistics were done by statistical program package for the social sciences (version 25.0; SPSS Inc., Armonk, New York, USA).

**Table 1: showed the age of the patients**

	N	Minimum	Maximum	Mean	Std. Deviation
age	17	19	31	22.94	3.344

**RESULTS**

This study was conducted on 17 pregnant ladies with inguinal swelling. The mean age of the patients 22.94±3.34 years (Table 1).

Most patients 14/17 presented with inguinal swelling without pain, while 3/17 patients had inguinal swelling and pain (Table 2).

Ten gravida<sub>1</sub> patients had inguinal swelling for the first time in their life during the current pregnancy. Five multipara patients had inguinal hernial like swelling during previous pregnancies that disappeared after labor and recurred during this pregnancy. Two patients had right inguinal swelling that appeared before they became pregnant and not related to previous pregnancies and were diagnosed as inguinal hernia patients. Two patients, one multigravida and one gravida<sub>1</sub>, had inguinal swelling for the first time in her life during the current pregnancy (Table 3,4).

**The ultrasound with Doppler study revealed (Table 4,1S):**

The two patients who had inguinal swelling not related to the current or previous pregnancies and were diagnosed as inguinal hernia patients the ultrasonography revealed right-sided inguinal hernia in both patients.

The four patients with bilateral inguinal swelling had bilateral round ligament varicosities.

The six patients with right-sided inguinal swelling, one patient had a right inguinal hernia, and the other 6 ladies had round ligament varicosities.

The five patients with left-sided inguinal swelling, only one patient had left inguinal hernia and the other three patients had round ligament varicosities.

The total patients with inguinal hernias were 4 patients; two of them were diagnosed before the occurrence of the pregnancy, and two patients during pregnancy. Thirteen patients with inguinal swelling had round ligament varicosities by ultrasound examination (Table 5).

Thirteen Patients with round ligament varicosities are managed conservatively, and it disappeared spontaneously after labor. Four patients with inguinal hernias, three of them were managed by concomitant cesarean section and preperitoneal inguinal hernioplasty. The other patient with an inguinal hernia delivered by normal vaginal labor and the inguinal hernia was repaired later (table 6).

**Table 2: showed the presenting symptoms**

presentation	Frequency	Percent
Swelling	14	82.4
Pain and swelling	3	17.6
Total	17	100.0

**Table 3: showed the distribution of inguinal swellings among patients**

	Swellings unrelated to pregnancy	Pregnancy-related swelling	Total
Right inguinal swelling	2 (11.8%)	6 (35.3%)	8 (47.1%)
Left inguinal swelling	0	5 (29.4%)	5 (29.4%)
Bilateral inguinal swelling	0	4 (23.5%)	4 (23.5%)
Total	2 (11.8%)	15 (88.2%)	17 (100%)

**Table 4: crosstabulation of ultrasound findings, site of the swelling, and time of the first presentation**

Ultrasound finding		Time of the first presentation		
		Not related to pregnancy	to	During pregnancy (current or previous)
Hernia	Site	Right inguinal swelling	2	1
		Left inguinal swelling	0	1
	Total		2	2
Round ligament varicosities	Site	Right inguinal swelling		5
		Left inguinal swelling		4
		Bilateral inguinal swelling		4
	Total			13
Total	Site	Right inguinal swelling	2	6
		Left inguinal swelling	0	5
		Bilateral inguinal swelling	0	4
	Total		2	15

**Table 5: showed the ultrasound investigation findings among patients.**

	Frequency	Percent
Hernia	4	23.5
Round ligament varicosities	13	76.5
Total	17	100.0

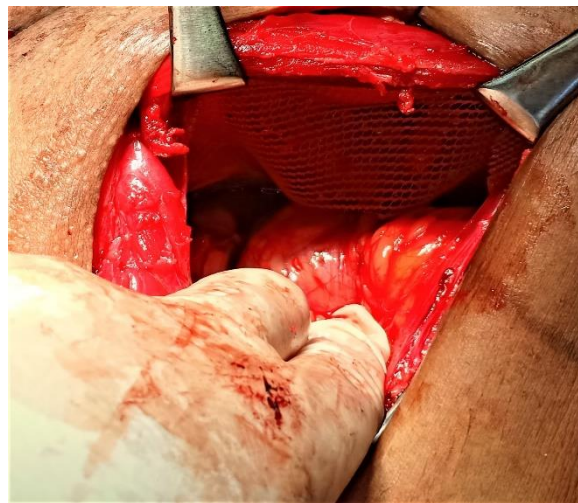
**Table 6: showed how the patients in this study managed**

	Frequency	Percent
Cesarian section with hernia repair	3	17.6
Vaginal delivery with later hernia repair	1	5.9
Varicosities conservatively managed disappeared spontaneously after labor	13	76.5
Total	17	100.0

**Table 1S: crosstabulation of ultrasound findings, time of the first presentation, and Gravidity**

Ultrasound finding		Gravidity	
		First pregnancy	Multigravidity
Hernia	Not related to pregnancy	1	1

Ultrasound finding			Gravidity	
			First pregnancy	Multigravidity
	Time of the first presentation	During the current pregnancy	2	0
	Total		3	1
Round ligament varicosities	Time of the first presentation	During the current pregnancy	8	0
		recurrent swelling started at previous pregnancies	0	5
	Total		8	5
Total	Time of the first presentation	Not related to pregnancy	1	1
		During the current pregnancy	10	0
		recurrent swelling started at previous pregnancies	0	5
	Total		11	6



**Figure 1S: the polypropylene mesh applied in the preperitoneal space covering the hernia defect**



**Figure 1: the preperitoneal space, the tip of the forceps passes through the deep inguinal ring after cutting the round ligament.**

**DISCUSSION**

The most common differential diagnosis of a groin lump is inguinal hernia [8,9]. Although inguinal hernias are not common in women, increased intraabdominal pressure during pregnancy can lead to this condition. Its incidence in pregnancy has

been reported to be 1 in 1,000–3,000[10]. Round ligament varicosities during pregnancy are rare, and can easily be mistaken for an inguinal hernia. The diagnosis of round ligament varicosities can be established on gray-scale and color Doppler sonography[11].



Round ligament varicosities are prominent veins within the round ligament and occur only during pregnancy because pregnancy promotes increased venous flow and reduced venous tone. High progesterone levels during pregnancy may cause the dilatation of these veins [12]. This condition typically occurs during and after the second trimester of pregnancy [13].

Round ligament varicosities are difficult to differentiate from inguinal hernia. Guillem and his colleagues reported surgical intervention of suspected inguinal hernia during pregnancy. The diagnosis of round ligament varicosities was made during surgical exploration [5].

In this study, 17 pregnant patients presented by unilateral or bilateral inguinal reducible swelling with impulse on cough. Five multigravida patients gave a history of swellings of the same characters during the previous pregnancies and disappeared spontaneously after labor. Ultrasound examination for these five patients revealed round ligament varicosities. Two of our patients gave a history of inguinal swelling with no relation to pregnancy and were diagnosed as inguinal hernia patients, ultrasound examination confirmed the diagnosis. Ten gravida<sub>1</sub> patients had inguinal swelling for the first time in the current pregnancy, ultrasound examination revealed one patient with inguinal hernia and eight patients with round ligament varicosities. One multigravida patient had swelling for the first time, ultrasound examination revealed an inguinal hernia.

All patients were investigated by ultrasonography with Doppler study. This investigation revealed round ligament varicosities in most cases, 13/17 (76.47%) patients. Four (23.53%) patients showed inguinal hernia in ultrasonography, 2 patients were diagnosed as hernia patients before pregnancy and another 2 patients have developed hernia during the pregnancy.

In this study, patients with inguinal hernia had been offered either to operate on the inguinal hernia at the time of delivery if they were scheduled for an elective cesarean section or operated for the hernia in a separate procedure. The patients preferred to manage the hernia at the time of the cesarean section. One patient with an inguinal hernia (left inguinal) delivered by normal vaginal labor. The three other patients were operated for the hernia (right-sided inguinal hernia) with the cesarean section. In patients who were operated for the hernia at the time of the cesarean section, there was no complication related to the application of the polypropylene mesh. There was no extra time to return to normal daily activities more than the cesarean section only.

Gabriele and his colleagues reported inguinal hernioplasty at the time of the cesarean section by tension-free Liechtenstein hernioplasty using a polypropylene mesh with no serious complications. They entered the inguinal canal after dissecting the subcutaneous tissue inferior to Pfannenstiel incision exposing the external oblique aponeurosis [14].

Surgit and his colleagues conducted a study on fifteen patients and concluded that the simultaneous approach of cesarean delivery and preperitoneal inguinal hernia repair with mesh use can be considered as a safe, effective surgical option for selected cases. This combination provides benefits of the presence of two operations in one session with single anesthesia, single incision, avoiding rehospitalization, and reducing costs [15].

### CONCLUSION

The diagnosis of an inguinal hernia depending on the clinical picture only during pregnancy may be misleading in most cases. Concomitant preperitoneal inguinal hernioplasty with cesarean section is feasible.

### DISCLOSURE OF POTENTIAL CONFLICTS OF INTEREST

The authors received no financial support for the research, authorship, and/or publication of this article.

The authors report no conflicts of interest.

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### How to cite

Orban, Y., Heraiz, A., Mansour, M., Heggy, I. Inguinal swelling during pregnancy, how to manage?. Zagazig University Medical Journal, 2023; (39-44): -. doi: 10.21608/zumj.2020.41329.1932