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Bebekte Over Sliding Herni Onarımı için İdeal Ameliyat Zamanı

Optimal Timing for Ovarian Sliding Hernia Repair in an Infant

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ÖZ

Amaç: Over sliding herni genellikle acil veya erken ameliyat edilir. Son zamanlarda bu hastalara elektif cerrahi önerilmektedir. Ancak ameliyat için net bir zaman belirlenememiştir. Amacımız bebeklerde over sliding herni için ideal ameliyat zamanını belirlemektir.

Materyal ve Metot: Kliniğimizde 2011-2021 yılları arasında redükte edilemeyen inguinal herni nedeniyle ameliyat edilen kız bebeklerin verileri incelendi. Over sliding hernisi olan hastaların verileri yaş, klinik bulgu ve cerrahi sonuçlar açısından değerlendirildi.

Bulgular: Redükte edilemeyen 76 inguinal herninin % 85,5'inde (n=65) over sliding herni tespit edildi. Over sliding hernili hastaların yaş aralığı 0-3 ay %76,9 (n=50), 3-6 ay %23,1 (n=15) ve 6-12 ay %0(n=0) idi. 0-3 ay grubunda over torsiyonu saptanmazken, 3-6 ay grubunda huzursuzluk, kasıkta şişlik ve hassasiyet şikayeti olan bir hastada over torsiyonu saptandı.

Sonuç: Over sliding herni 0-3 ayda daha sık olmasına rağmen bu dönemde hiçbir hastada over torsiyonu saptanmadı. Bu hastaların ameliyatı 3 aylık olana kadar ertelenebilir.

Anahtar Kelimeler: Ameliyat zamanlaması, bebek, over sliding herni

ABSTRACT

Objective: Ovarian sliding hernia is usually operated on emergently or early. Recently, elective surgery has been recommended. However, the ideal time for surgery has not been clarified. The study aims to determine the ideal surgery timing for an infant's ovarian sliding hernias.

Materials and Methods: The data of non-reducible inguinal hernia in female infants revived who were operated on at our clinic between 2011 and 2021. The data of ovarian sliding hernias were evaluated for age, clinical findings and surgical outcomes.

Results: Of the 76 non-reducible inguinal hernias, 85.5% (n = 65) were found to have sliding hernias of the ovary. The age range of ovarian sliding hernias were 0–3 months 76.9% (n = 50), 3–6 months 23.1% (n = 15) and 6-12 months %0 (n=0). No ovarian torsion was detected in the age group 0-3 months, ovarian torsion was detected in one patient in age group 3–6 months, who also complained of restlessness, swelling in the groin, and tenderness.

Conclusion: Although ovarian sliding hernia is more common in 0–3 months, ovarian torsion was not detected in any patient in this period. Surgery for ovarian sliding hernia should be delayed until three months of age.

Keywords: Infant, ovarian sliding hernia, surgery timing

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INTRODUCTION

Inguinal hernia is one of the most common surgeries performed by pediatric surgeons. The non-strangulated inguinal hernias are operated on semi-electively, strangulated inguinal hernia requires emergent surgical treatment.[1] There is no consensus regarding the ideal time of surgery for inguinal hernia in infants hospitalized in the neonatal intensive care unit and sliding hernia of the ovary in female infants.[2,3]

Several studies have been performed on the timing of surgery for sliding hernia of the ovary. There are studies suggesting urgent surgery due to the risk of ovarian torsion, as well as suggesting elective surgery due to the low risk of torsion.[4,5] Recently, elective surgery is recommended. However, there is no consensus on an ideal time for surgery. If the decision is to wait for elective surgery, how long to wait is not defined.

In the study, it was aimed to contribute to the studies of determining the operative time for an ovarian sliding hernia. We reviewed the data of female patients aged <1 year who underwent surgery at our clinic for the treatment of non-reducible inguinal hernias. The data of sliding hernia of the ovary was evaluated in terms of age, clinical symptoms, duration between the onset of symptoms and surgery, and surgical outcomes.

MATERIALS AND METHODS

Ethical Status: Our study was approved by the Umraniye Training and Research Hospital Ethics Committee (Date: 13.03.2020, decision no: 7501). The parents of the patients included in the study were informed and their consent was obtained. The study was carried out following the international declaration, guidelines, etc

Design of the Study: Files of female patients aged <1 year who underwent surgery for non-reducible inguinal hernias at Health Sciences University Umraniye Training and Research Hospital and Sivas State Hospital pediatric surgery clinics between January 2011 and January 2021 were reviewed. The data of sliding hernias of the ovary were evaluated.

Diagnosis and Surgical Treatment Decision: In all the patients, diagnosis of inguinal hernia and decision for surgery were made by pediatric surgeons based on the history, symptoms, and clinical examination findings. Ultrasonography was performed for definitive diagnosis when required. Sliding hernias of the ovary were operated emergently or early. The infants who were operated within the first 12 hours after hospital admission were classified as emergently surgery and those who were operated on after 12 hours were classified as early surgery. The non-reducible inguinal hernias that the hernia content could not be identified during operation, as it was spontaneously reduced under general anesthesia were excluded from the study.

Surgical Technique and Evaluation of Results: Open surgery was performed with a classic inguinal crease incision in all patients. The hernia sac was opened and the contents of the sac were evaluated. The hernia contents (ovary, intestine, omentum) were reduced back into the abdomen, high ligation of the hernia sac was performed, and the inguinal defect was closed using sutures. Patients with sliding hernias of the ovary were classified as 0–3, 3–6, and 6–12 months based on the age of the infant during surgery. Patients were also classified based on the duration between the symptom onset and surgery. The operative results were evaluated in terms of ovarian torsion and ovarian circulation.

Statistical Analysis: IBM SPSS Statistics 22 (SPSS IBM, Türkiye) software was used for the statistical analysis of the study findings. To evaluate the study data, descriptive statistical methods (i.e., mean, standard deviation, and frequency), as well as the one-way chi-square test, were used to compare qualitative data. Significance was considered at $p < 0.05$ level.

RESULTS

This study was performed with 76 non-reducible inguinal hernias in female patients aged < 1 year. The age of these patients ranged from 0.4 months (12 days) to 8.9 months; the mean age was 2.21 ± 1.45 months, and the median age was 1.7 months.

Table 1. Data on patients with non-reducible inguinal hernias aged < 1 year.

	Mean±SS	**Median**	**Min-Max**
Age (month)	2,21±1,45 month	1.7 month	0,4-8.9 month
			n (%)
Age (n=76)		0-3 month	58 (76.3)
		3-6 month	17 (22.4)
		6-12 month	1 (1.3)
		Total	76 (100)
Contain hernia (n=76)		Ovary	65 (85.5)
		Bowel	10 (13.2)
		Omentum	1 (1.3)
		Total	76 (100)

The distribution of irreducible hernias in female infants was 76.3% (n = 58) 0-3 months, 22.4% (n = 17) 3-6 months and 1.3%(n=1) 6-12 months. Hernia content was ovarian in 85.5% (n = 65), intestinal in 13.2% (n = 10), and omental in 1.3% of the patients (n = 1) (Table 1).

The patients have sliding hernias of the ovary ranging between 0.4 and 5.3 months (mean: 2.14 ± 1.27 months). The age distribution was 76.9% (n = 50) 0-3, 23.1% (n = 15) 3-6 months and %0(n=0) 6-12 months. The incidence rate of sliding hernias of the ovary in patients aged 0–3 months was significantly higher when compared with that in children aged 3–6 and 6–12 months ($p = 0.001$; $p < 0.05$). The highest incidence of ovary is on the right side (65%), followed by the left side (26.7%). The incidence of bilateral ovaries (8.3%) is the lowest. There is a statistically significant difference between the hernia side distributions of children with ovarian sliding ($p<0.05$). Emergency surgery was performed in 18.5% (n = 12) of sliding hernias of the ovary, and early surgery was performed in 81.5% (n = 53). There was a statistically significant difference between the timing of surgery in children with ovarian sliding ($p<0.05$) (Table 2).

According to operative results, ovarian torsion was not detected in any of the 50 ovarian sliding hernias in the 0-3 month group. Ovarian torsion was detected in one of 15 hernias in the 3-6 month group (a 4-month-old baby) **(**Table3**)**.

The patient with ovarian torsion had complaints of restlessness, swelling and tenderness in the groin. Diagnosis of ovarian torsion was made preoperatively by ultrasound. Emergency surgery was performed. The ovary was made detorsioned, ovarian circulation was good. On ultrasonography performed one, three and six months after the surgery, both ovaries were found to be normal in size and circulation.

Table 2: Evaluation of patients with sliding hernias of the ovary aged < 1 year in terms of age, hernia side and timing of surgery.

	Mean±SS	**Median**	**Min-Max**
Age (month)	2,14±1,27 month	1.7 month	0.4-5.3 month
		n (%)	**p**
Side Patients (n=60)	Right	39 (65.0)	0.001*
	Left	16 (26.7)	
	Bilateral	5 (8.3)	
	Total	60 (100)	
Hernia (n=65)			
Age	0-3 Month	50 (76.9)	0.001*
	3-6 Month	15 (23.1)	
	Total	65 (100)	
Operation timing	Emergency	12 (18.5)	0.001*
	Early	53 (81.5)	
	Total	65 (100)	

*: One-Way Chi-Square Test and $p<0.05$.

Table3: Evaluation of 65 ovarian sliding hernia in terms of torsion according to per operative results.

	Age	**Hernia n (%)**	**Ovarian torsion n (%)**
Ovarian sliding hernia (n=65)	0-3 months	50 (76.9)	0 (0)
	3-6 months	15 (23.1)	1 (6.7)
Total		65 (100)	1 (1.5)

DISCUSSION AND CONCLUSION

Result of the study, there was no ovarian torsion in any infant in the 0-3 month group, ovarian torsion was found in one infant in the 3-6 month group.

Peritoneal invagination extending into the inguinal canal with the round ligament in females is called the Nuck canal. This is the analog of procesus vaginalis in males. This channel closes between the eighth month of pregnancy and one year after birth.[6] An indirect inguinal hernia occurs due to the inability of this canal to close. The hernia sac may involve the omentum, intestine, appendix, ovary and/or uterus.[1,7] Sliding hernias of the ovary constitute the majority (77.4%–83.5%) of non-reducible inguinal hernias in female infants.[4,8] Studies have shown that the rate of torsion in sliding hernias of the ovary varies between 0% and 28.9%.[5,8]

Although several studies have been performed on the timing for surgery for sliding hernia of the ovary.[4,5,9] There is no consensus on the time of surgery

for an ovarian sliding hernia. Furthermore, there are studies suggesting that the surgery should be delayed because of the physiological liability in neonatal and early infancy periods and the high risk associated with surgery and anesthesia in emergency surgeries.[10-12]

While most of the previous studies recommended emergency surgery for sliding hernias of the ovary because of the risk of torsion. Recently studies have reported that emergency surgical treatment is not required. Takeshi Hirabayashi et al.[5] and Kurobe et al.[13] presented two important studies reporting that emergency surgical treatment is not required for sliding hernias of the ovary. In their study published in 2017, Takeshi Hirabayashi et al.[5] followed 71 patients with sliding hernias of the ovary until the age of 9 months. They reported that none of these patients developed ovarian torsion and the hernia spontaneously disappeared in 10 patients. Hence, they recommended that surgery for sliding hernia of the ovary was not required in the neonatal and early infancy period and that surgery should be delayed until 9 months of age. In 2019, Kurobe et al.[13] reported in their study that ovarian torsion did not develop in any of the low-weight newborn patients with sliding hernia of the ovary who were followed up in the neonatal intensive care unit and that the mean age of patients who were operated before discharge was 94 days. They recommended that low-weight newborns did not require emergent surgery, but should be operated on prior to discharge because of the risk of torsion.

When the studies are evaluated carefully, the incidence of ovarian torsion in sliding hernias of the ovary is hardly ever in the age of 0–3 months.[3,13,14] Ovarian torsion in the sliding hernia of the ovary may associate with the development of the baby. During the development of the embryo/fetus, organs usually grow proportionally. The ovary also grows during organogenesis in the intrauterine and postnatal periods due to maternal hormones. The length of the ovary reaches its maximum in the third month after birth, whereas the transverse diameter continues to grow slightly but more slowly. Other organs continue to grow.[15,16]

Ovarian torsion is less frequent in the first 3 months due to the fact that the ovary, which continues to grow in proportion to body development, is not able to move freely within the hernia sac. After the third month, although the body continues to grow, the ovary does not, which causes the ratio between the ovary and hernia sac to deteriorate in favor of the sac and allows the ovary to move freely within the hernia sac. This may lead to torsion of the ovary as the age advances.

Surgeons who recommend elective surgery followed their patients by ultrasonography. Indeed, it is possible to determine hernia contents and evaluate ovarian torsion and circulation with ultrasonography.[17-19] However, it may not be possible to detect ovarian torsion in time using periodic ultrasonography. Only half of the patients with ovarian torsion are admitted to the emergency department, other torsions are detected incidentally during planned surgery.[20] Meriman et al.[14] recommended emergency surgery for sliding hernia with ovary and reported that all 11 patients with torsion experienced tenderness along with swelling and five had localized erythema; this indicates the importance of clinical findings in the emergency surgery decision of these patients. Therefore, it is important to determine how long can the surgery be postponed in order to prevent ovarian loss

In our study, although 76.9% of the patients were in the age group of 0–3 months at the time of surgery, none in this age group had ovarian torsion. Ovarian torsion was detected in one baby in the age group of 3–6 months (a 4-month-old baby) who presented with symptoms of restlessness, swelling in the groin, and tenderness. The ovary was detorsioned with emergency surgery and ovarian circulation was determined to be good. Ultrasonography performed one, three and six months after the surgery revealed both ovaries were normal in size and circulation.

In conclusion, ovarian torsion in sliding hernias of the ovary is hardly ever in the age of 0–3 months. We believe that surgery in infants with sliding hernias of the ovary without clinical symptoms of torsion should be postponed until 3 months of age to avoid surgery and anesthesia complications. The limitations of our study were its retrospective nature and the absence of a control patient group (without surgery), as the patients were operated on emergently and early.

Ethics Committee Approval: Our study was approved by the Umraniye Training and Research Hospital Ethics Committee (Date: 13.03.2020, decision no: 7501). The study was carried out following the international declaration, guidelines, etc.

Conflict of Interest: No conflict of interest was declared by the authors.

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