Acta Medica Alanya

RESEARCH ARTICLE

ARAŞTIRMA

Acta Medica Alanya

2020;4(2): 175-179

DOI:10.30565/medalanya.696769

Risk factors and surgical treatment methods in femoral hernia

Femoral Hernide Risk Faktörleri ve Cerrahi Tedavi Yöntemleri

Salih Tosun[1], Muhammet Ali Aydemir[1]*, İhsan Metin Leblebici[1], Özgür Ekinci[1], Oktay Yener[1], Orhan Alimoğlu[1]

1. *Istanbul Medeniyet University, Faculty of Medicine, Department of General Surgery, İstanbul,Turkey*

ABSTRACT

Aim: Femoral hernias are more common in the right groin and in the female population. Elective hernia surgery after diagnosis is the most suitable option for femoral hernias, due to fewer complications and shorter length of hospitalization. In this study, we analysed the factors affecting clinical outcomes in patients undergoing urgent or elective early surgery, due to femoral hernia.

Materials and methods: In this retrospective study, all elective and urgent femoral hernias that were operated between January 2017 and January 2020 were analysed. Routine imaging tests were not applied to the patients and ultrasonography (USG) was applied in the presence of clinical suspicion.

Results: 38 femoral hernia patients were operated on during the 3 years observation period. According to the type of surgery, 30 patients underwent hernia repair with mesh and 8 patients underwent suture repair. Of the 28 patients operated electively, 5 were male and 23 were female. 17 of the patients were right and 11 were left femoral hernia. Of the 10 patients who were operated urgently due to strangulation or incarceration, 4 were male and 6 were female. 7 of the patients were right and 3 were left femoral hernia. 3 of the urgently operated patients underwent intestinal resection due to strangulation.

Conclusion: Femoral hernias were more common in women and especially in the right side, and emergent femoral hernia surgery resulted in more intestinal resection and longer patient hospitalization. In particular, we think that the application of USG with physical examination in women will increase the diagnosis rates of femoral hernias. In addition, we think that the diagnosis of preoperative femoral hernia will decrease recurrence rates by choosing the right surgical technique.

Keywords: Hernia, femoral hernia, inguinal hernia

ÖZ

Amaç: Femoral fıtıklar sağ kasıkta ve kadınlarda daha sık görülürler. Daha az komplikasyon ve yatış süresi sebebiyle femoral fıtık olgularında teşhis sonrası erken elektif fıtık cerrahisi en uygun seçenektir. Bu çalışmada femoral fıtık nedeniyle acil ya da elektif erken ameliyat edilen hastalarda klinik sonuçlara etki eden faktörleri araştırdık

Gereç ve yöntemler: Bu retrospektif çalışmada Ocak 2017-Ocak 2020 tarihleri arasında ameliyat edilen femoral fıtıklar incelendi. Hastalara rutin pre-op görüntüleme yöntemleri kullanılmamakla beraber klinik şüphe varlığında ultrasonografi (USG) uygulandı.

Bulgular: 3 yıllık süre içinde 38 femoral fıtık hastası ameliyat edildi. Ameliyat tipi olarak 30 hastaya yamalı onarım, 8 hastaya yamasız onarım uygulandı. Elektif olarak ameliyat edilen 28 hastanın, 23'ü kadın 5'i erkekti. Hastaların 17'si sağ 11'i sol femoral fıtıktı. Acil olarak ameliyat edilen 10 hastanın 6'sı kadın, 4'ü erkekti. Hastaların 7'si sağ 3'ü sol femoral fıtıktı. Hastaların post-operatif ortalama hastane yatış süresi 143 saatti. Hastaların 3'üne strangülasyon nedeniyle bağırsak rezeksiyonu uygulandı.

Sonuç: Femoral fıtıklar kadınlarda ve özellikle sağ kasıkta daha sık saptanmış; acil uygulanan femoral fıtık cerrahisi daha fazla bağırsak rezeksiyonu ve uzun hasta yatış sürelerine yol açmıştır. Özellikle kadınlarda USG'nin fizik muayene ile birlikte uygulanması gözden kaçabilecek femoral fıtıkların teşhis oranlarını artıracağını düşünmekteyiz. Ayrıca preoperatif femoral fıtığın teşhisinin, doğru ameliyat tekniği seçimiyle nüks oranlarını da düşüreceğini düşünmekteyiz.

Received: 02.03.2020 Accepted: 11.04.2020 Published (Online):12.07.2020

*Corresponding author: Aydemır M.A, Istanbul Medeniyet University Goztepe Education and Research Hospital, Eğitim St. Dr. Erkin Ave. Kadıköy, Istanbul,Turkey. Tel: +905442392463 E-mail: maliaydemir1990@gmail.com

ORCID: 0000-0003-0240-0924

To cited: Tosun S, Aydemir MA, Leblebici İM, Ekinci Ö, Yener O, Alimoğlu O. Risk Factors and Surgical Treatment Methods in Femoral Hernia. Acta Med. Alanya 2020;4(2):175-179. doi:10.30565/medalanya.696769

INTRODUCTION

Inguinal hernias are 9 to 12 times more common in males than females, but femoral hernias occur 4 times more in females [1]. This difference can be explained by the longer distance between pubic tubercle and the internal inguinal ring and a wider rectus abdominis muscle in women [2].

Inguinal and femoral hernias are more common in the right groin. This situation is thought to be caused by the delay of closure of the processus vaginalis, due to the later descending of the right testicle to the scrotum during fetal development. It is also thought that the position of the sigmoid colon reduces the development of hernia on the left, by creating a barrier in front of the left femoral canal.

Diagnosis of femoral hernias is difficult [3,4] and although only a physical examination is sufficient for deciding on surgery for a groin hernia, ultrasonography (USG) helps in cases such as obesity, occult hernias, femoral hernias and concurrent hernias [5]. USG also shows high sensitivity for inguinal - femoral hernia separation, in particlular in groin hernias in women. But even in cases where physical examination and ultrasound are combined, femoral hernias can be overlooked [3,4,6].

Since strangulation and incarceration are more common in femoral hernias, “close follow-up” is not among the treatment options, unlike inguinal hernias. Elective hernia surgery after diagnosis is the most suitable option for femoral hernias due to less complications and length of hospitalization [7-13].

In this study, we analysed the factors affecting clinical outcomes in patients undergoing urgent or elective early surgery, due to a femoral hernia.

MATERIALS AND METHODS

The present study was a single-center retrospective analysis and after obtaining permission from the hospital ethics committee with the certificate number 2018/0139, groin hernias operated on between 2017 and 2020 were examined. There were 38 femoral hernia patients among 1650 emergency and elective operated groin hernias, and these patients were included in the study. All patients over the age of 18 who were operated for an urgent, elective, recurrent or primary femoral hernia (Figure 1) were included in the study. Age, gender, hernia type and side, imaging method used for the diagnosis of hernia, ASA scores and surgical procedures were analyzed from the hospital system and patient files. All patients were invited for outpatient control at post-op 1st week, 1st month and 6th month. The control method was a physical examination, but in case of clinical suspicion, other imaging methods, primarily USG (Figure 2), were also used.

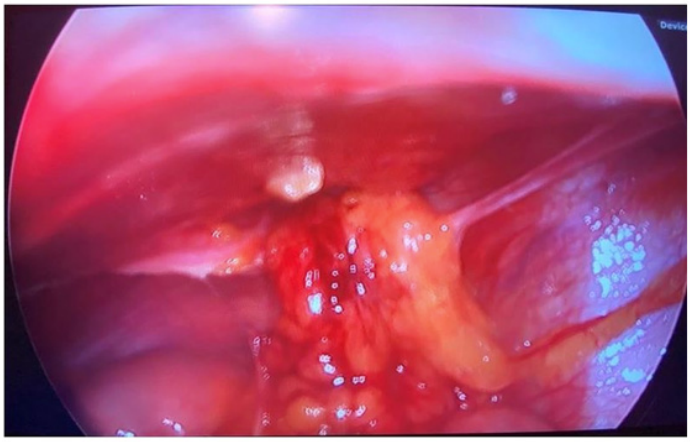

Figure1. Laparoscopic view of omental strangulation

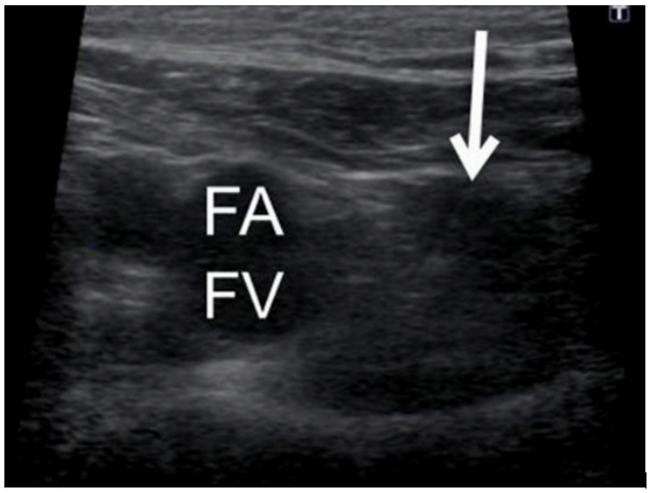

Figure 2. US imaging below inguinal ligament in the axial plane demonstrate herniation sac protursion (arrow) just medial to the femoral artery/vein (FA/FV)

The patients were divided into two groups, one as emergency and the other as elective. Data collected between both groups were analyzed comparatively. Data was analyzed with the SPSS Statistics Version 26 using student t test and $P<0.05$ was considered statistically significant.

RESULTS

During the course of three years, 38 femoral hernia patients were operated on. The ratio of all femoral hernia surgeries performed in our clinic to all hernia surgeries was 2.3%. Of the 28 patients operated electively, 5 were male and 23 were female, whereas 17 of the patients were right and 11 were left-sided femoral hernias. 76.3% of the cases were women (p = 0.002) and 63.2% of the hernias were on the right side (p = 0.001), whereas 4 of the patients were operated on due to a recurrent hernia. Preoperative USG examination was performed in 13 of the patients and the rate of preoperative femoral hernia diagnosis with USG was 23%. Surgery was decided upon for 14 patients following only a physical examination. There was no patient who underwent intestinal resection in the elective group. The mean post-operative hospital stay of these patients were 31.3 hours. The mean age of the patients was 59.25 ± 14.7. When ASA risk assessment of all femoral hernia patients was performed, 8 patients were seen as ASA I, 17 patients as ASA II, and 3 patients as ASA III. There was no ASA IV patient. According to the type of surgery, 22 patients underwent hernia repair with mesh and 6 patients underwent suture repair. Regarding the method for surgery with mesh, 8 patients had a Lichtenstein repair, 11 patients had plug mesh repair, and 3 patients had laparoscopic repair (Table 1). In the classification of hernias, 26 of the femoral hernias were Stage I, two were Stage II femoral hernias whereas 4 patients in stage I group were recurrent femoral hernias (Table 2).

Of the 10 patients who were operated urgently due to strangulation or incarceration, 4 were male and 6 were female, 7 of the patients were right and 3 were left sided femoral hernia. One of the patients was operated on due to recurrent hernia and 6 of the patients underwent preoperative USG. The rate of preoperative femoral hernia diagnosis with USG was 17%. One patient was determined to be operated on only following a physical examination, and 3 of the urgently operated patients underwent intestinal resection due to strangulation. The average postoperative hospital stay of these patients was 143 hours. The length of hospital stay was longer in the emergent group and it was statistically significant (p = 0.001). The mean age of the patients was 63.4 ± 17.3 years. When ASA risk assessment of all femoral hernia patients was performed, 9 patients were seen as ASA I,one patient as ASA III and there was no ASA II and ASA IV patients. According to the type of surgery, 8 patients underwent hernia repair with mesh and 2 patients underwent suture repair. All the patients in this group had surgery with plug mesh method (Table 1). In the classification of hernias, 9 of the femoral hernias were Stage I and one was Stage II femoral hernia, whereas one patient in stage I group was recurrent femoral hernia (Table 2).

Table 1: Patients operated with the diagnosis of femoral hernia

		Group 1: Elective	Group 2: Emergent	P Value
Number of patients,(n)		28	10	
Gender	Female	23	6	0,002
	Male	5	4	
Mean age,(y)		59,25±14,7	63,4±17,3	
Hernia Side,(n)	Right	17	7	0,001
	Left	11	3	
Patients performed USG,(n)		13	6	
Femoral hernia diagnosed with USG,(n)		3	1	
Intestinal resection,(n)		0	3	
Length of stay,(h)		31,3±19,2	143±55,6	0,001
ASA Score,(n)	I	8	9	
	II	17	0	
	III	3	1	
Types of hernia repair,(n)	Mesh	22	8	
	Suture repair	6	2	
Types of surgery,(n)	Suture repair	6	2	
	Liectenstein repair	8	0	
	Plug mesh repair	11	8	
	Laparoscopic repair	3	0	

DISCUSSION

Femoral hernias constitute 2 to 4% of all elective and emergent groin hernia surgeries [1]. In our study, the femoral hernia rate was 2.3%. Femoral hernias occur more often in women and on the right groin and similarly, in our study, they were

indeed observed more frequently in women and in the right groin. Unlike inguinal hernias, follow-up is not recommended in femoral hernias since complications and intestinal resections are higher. Elective repair is strongly recommended [8-11]. We also do not recommend follow-up for femoral hernias in our clinic. There were no patients who were being followed up in the emergent group.

Table 2: Distribution of patients according to EHS hernia classification.

	F		R	
	Elective	Emergent	Elective	Emergent
I	22	8	4	1
II	2	1	0	0
III	0	0	0	0

F: Femoral, R: Recurrence, I: <2cm, II: 2-4cm, III: >4cm

Of the patients who had emergent femoral hernia surgery, more intestinal resection and longer hospitalization was observed [7,12,13]. In our study, intestinal resection was performed in 3 cases in the emergent group, which also experienced a longer hospital stay.

In obesity, occult hernias, femoral hernias, and concurrent hernias, USG can be used in addition to physical examination to help diagnosis [5], where it demonstrates a high sensitivity for the diagnosis of femoral hernia, aspecially in women. In our study, preoperative femoral hernia was successfully diagnosed in 18 patients by physical examination and USG together.

However femoral hernias can be missed, even when physical examination and USG are combined [3,4,6]. There may be cases where the presence of inguinal hernia is diagnosed, but the femoral hernia is overlooked or not observed. When we analysed of the groups, 15 of the patients could not be diagnosed with physical examination, and 19 of them, with the combination of physical examination and USG both.

In our study, the diagnosis was inguinal hernia in the previous operation in 4 of the recurrent cases.

Unlike inguinal hernia repair, suture repair is still an acceptable option in femoral hernia repair [5]. There are centers with similar results in terms of recurrence between the two methods [22], as well as series indicating less recurrence rate in mesh repair [17,20]. In our clinic, 30 patients underwent hernia repair with mesh and 8 patients underwent suture repair. Notably, all recurrent hernia cases had undergone repair ith mesh and in such surgeries, there was no difference found between plug mesh and flat mesh repair in terms of recurrence and mesh reaction [20-22]. However, plug mesh fares worse in terms of patient comfort in the following years, causing pain and mass sensation [23,24] and plug mesh has a higher risk of mesh erosion than flat mesh. At the same time, mesh migration is more common in plug mesh than the flat mesh in the first 2 to 3 years. While the mesh shrinkage can be seen up to 20% in flat mesh [25,26], this rate can be up to 90% in plug mesh. Here, ease of use of the plug mesh method for the surgeon comes to the fore. In our study, the plug mesh method was used in 63.3% of hernia mesh surgeries and no recurrence was observed in these patients.

After the anterior repair of inguinal hernias, re-operation is more common in women and femoral hernia was found in about 40% of re-operation cases. These recurrences may be femoral hernias that have been overlooked in the first operation [14-19]. Therefore, laparoscopic repair should be preferred in women and mesh should be placed in such a way that both inguinal and femoral areas are covered[27]. In addition, the recurrence rate of laparoscopic repairs is lower than open repairs [17,20]. We also performed laparoscopic repair in 3 patients and none of these patients were diagnosed with femoral hernias preoperatively.

Limitations: Our inability to compare the repair methods we use in femoral hernias because of the low rate of patients who underwent femoral hernia repair in all groin hernia repairs, can be considered a limitation of this study, however, in literature, large series are not encountered in this regard. Additionnaly, since this study was performed retrospectively, physical examination and USG examinations of the patients were not performed by the same surgeon and radiologist, making the study heterogeneous.

Conclusion: Delays in the treatment of femoral hernias can lead to morbidity and mortality. Surgery should be performed immediately in these patients following diagnosis. Although physical examination alone is considered sufficient in the

diagnosis of femoral hernia, we think that the application of USG pre-operatively in all women and right groin hernias will increase the diagnosis rates of femoral hernias, thereby reducing re-operation rates. In addition, we think that the diagnosis of preoperative femoral hernia will decrease recurrence rates by choosing the right surgical technique.

Funding sources: There is no source of funding or financial interest in this study.

Conflict of Interest: The author has no conflict of interest related to this article.

REFERENCES

1. Simons MP, Aufenacker T, Bay-Nielsen M, Bouillot JL, Campanelli G, Conze J et al. European Hernia Society guidelines on the treatment of inguinal hernia in adult patients. Hernia. 2009;13(4):343-403. doi: 10.1007/s10029-009-0529-7.
2. Miserez M, Peeters E, Aufenacker T, Bouillot JL, Campanelli G, Conze J et al. Update with level 1 studies of the European Hernia Society guidelines on the treatment of inguinal hernia in adult patients. Hernia. 2014;18(2):151-63. doi: 10.1007/s10029-014-1236-6.
3. Primatesta P, Goldacre MJ. Inguinal hernia repair: incidence of elective and emergency surgery, readmission and mortality. Int J Epidemiol. 1996;25(4):835-39. doi: 10.1093/ije/25.4.835.
4. Hernández-Irizarry R, Zendejas B, Ramirez T, Moreno M, Ali SM, Lohse CM et al. Trends in emergent inguinal hernia surgery in Olmsted County, MN: a population-based study. Hernia. 2012;16(4):397-403. doi: 10.1007/s10029-012-0926-1.
5. International guidelines for groin hernia management. Hernia. 2018;22(1):1-165. doi: 10.1007/s10029-017-1668-x.
6. Burcharth J, Pedersen M, Bisgaard T, Pedersen C, Rosenberg J. Nationwide prevalence of groin hernia repair. PLoS One. 2013;8(1):e54367. doi: 10.1371/journal.pone.0054367.
7. Quintas ML, Rodrigues CJ, Yoo JH, Rodrigues Junior AJ. Age related changes in the elastic fiber system of the interfoveolar ligament. Rev Hosp Clin Fac Med Sao Paulo. 2000;55(3):83-6. doi: 10.1590/s0041-87812000000300003.
8. Ku JH, Jeong CW, Park YH, Cho MC, Kwak C, Kim HH. Nerve-sparing procedure in radical prostatectomy: a risk factor for hernia repair following open retropubic, pure laparoscopic and robot-assisted laparoscopic procedures. Scand J Urol Nephrol. 2011;45(3):164-70. doi: 10.3109/00365599.2010.544674.
9. Lughezzani G, Sun M, Perrotte P, Alasker A, Jeldres C, Isbarn H et al. Comparative study of inguinal hernia repair rates after radical prostatectomy or external beam radiotherapy. Int J Radiat Oncol Biol Phys. 2010;78(5):1307-13. doi: 10.1016/j.ijrobp.2009.09.065.
10. Sun M, Lughezzani G, Alasker A, Isbarn H, Jeldres C, Shariat SF et al.Comparative study of inguinal hernia repair after radical prostatectomy, prostate biopsy, transurethral resection of the prostate or pelvic lymph node dissection. J Urol. 2010;183(3):970-75. doi: 10.1016/j.juro.2009.11.036.
11. Yoshimine S, Miyajima A, Nakagawa K, Ide H, Kikuchi E, Oya M. Extraperitoneal approach induces postoperative inguinal hernia compared with transperitoneal approach after laparoscopic radical prostatectomy. Jpn J Clin Oncol. 2010;40(4):349-52. doi: 10.1093/jjco/hyp172.
12. Sekita N, Suzuki H, Kamijima S, Chin K, Fujimura M, Mikami K et al. Incidence of inguinal hernia after prostate surgery: open radical retropubic prostatectomy versus open simple prostatectomy versus transurethral resection of the prostate. Int J Urol. 2009;16(1):110-3. doi: 10.1111/j.1442-2042.2008.02190.x.
13. Koie T, Yoneyama T, Kamimura N, Imai A, Okamoto A, Ohyama C. Frequency of postoperative inguinal hernia after endoscope-assisted mini-laparotomy and conventional retropubic radical prostatectomies. Int J Urol. 2008;15(3):226-9. doi: 10.1111/j.1442-2042.2007.01983.x.
14. Bittner R, Arregui ME, Bisgaard T, Dudai M, Ferzli GS, Fitzgibbons RJ et al. Guidelines for laparoscopic (TAPP) and endoscopic (TEP) treatment of inguinal hernia [International Endohernia Society (IEHS)]. Surg Endosc. 2011;25(9):2773-843. doi: 10.1007/s00464-011-1799-6.
15. Poelman MM, van den Heuvel B, Deelder JD, Abis GS, Beudeker N, Bittner RR et al. EAES Consensus Development Conference on endoscopic repair of groin hernias. Surg Endosc. 2013;27(10):3505-19. doi: 10.1007/s00464-013-3001-9.
16. Tran H, Tran K, Turingan I, Zajkowska M, Lam V, Hawthorne W. Single-incision laparoscopic inguinal herniorraphy with telescopic extraperitoneal dissection: technical aspects and potential benefits. Hernia. 2015;19(3):407-16. doi: 10.1007/s10029-015-1349-6.
17. Tschuor C, Metzger J, Clavien PA, Vonlanthen R, Lehmann K. Inguinal hernia repair in Switzerland. Hernia. 2015;19(5):741-5. doi: 10.1007/s10029-015-1385-2.
18. Bay-Nielsen M, Kehlet H, Strand L, Malmstrøm J, Andersen FH, Wara P et al. Quality assessment of 26,304 herniorrhaphies in Denmark: a prospective nationwide study. Lancet. 2001;358(9288):1124-8. doi: 10.1016/S0140-6736(01)06251-1.
19. Ohene-Yeboah M, Abantanga F, Oppong J, Togbe B, Nimako B, Amoah M et al. Some aspects of the epidemiology of external hernias in Kumasi, Ghana. Hernia. 2009;13(5):529-32. doi: 10.1007/s10029-009-0491-4.
20. Abe T, Shinohara N, Harabayashi T, Sazawa A, Suzuki S, Kawarada Y et al. Postoperative inguinal hernia after radical prostatectomy for prostate cancer. Urology. 2007;69(2):326-9. doi: 10.1016/j.urology.2006.09.043.
21. Tsai PJ, Yu CC, Lee YH, Huang JK. Inguinal hernia after radical retropubic prostatectomy--experience of Kaohsiung Veterans General Hospital. J Chin Med Assoc. 2004;67(3):141-4. PMID: 15181967.
22. Ichioka K, Yoshimura K, Utsunomiya N, Ueda N, Matsui Y, Terai A et al. High incidence of inguinal hernia after radical retropubic prostatectomy. Urology. 2004;63(2):278-81. doi: 10.1016/j.urology.2003.09.038.
23. Klinge U, Klosterhalfen B. Modified classification of surgical meshes for hernia repair based on the analyses of 1,000 explanted meshes. Hernia. 2012;16(3):251-8. doi: 10.1007/s10029-012-0913-6.
24. Klosterhalfen B, Klinge U. Retrieval study at 623 human mesh explants made of polypropylene--impact of mesh class and indication for mesh removal on tissue reaction. J Biomed Mater Res B Appl Biomater. 2013;101(8):1393-9. doi: 10.1002/jbm.b.32958.
25. Silvestre AC, de Mathia GB, Fagundes DJ, Medeiros LR, Rosa MI. Shrinkage evaluation of heavyweight and lightweight polypropylene meshes in inguinal hernia repair: a randomized controlled trial. Hernia. 2011;15(6):629-34. doi: 10.1007/s10029-011-0853-6.
26. Ciritsis A, Hansen NL, Barabasch A, Kuehnert N, Otto J, Conze J et al. Time-dependent changes of magnetic resonance imaging-visible mesh implants in patients. Invest Radiol. 2014;49(7):439-44. doi: 10.1097/RLI.0000000000000051.
27. Goldet G, Howick J. Understanding GRADE: an introduction. J Evid Based Med. 2013;6(1):50-54. doi: 10.1111/jebm.12018.