

# A Simple and Effective Technique for Torn Hernial Sac Occurred During Large Inguinal Hernia Repair or Orchiopexy: Incision

## Dev İnguinal Herni Onarımı veya Orşiopeksi Sırasında Yırtılan Fıtık Kesesi İçin Basit ve Etkili Bir Teknik: İnsizyon

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### Öz

Dev inguinal herni onarımı veya orşiopeksi sırasında yırtılan fıtık kesesinin onarımı, uzman ellerde bile büyük zorluk oluşturur. Burada, fıtık kesesinin yırtılması ile karşılaşılan vakalarda yüksek ligasyon yapmayı kolaylaştıran bir tekniği sunmayı amaçladık. İnsizyon tekniğimizin adımları şöyledir: Kesenin lateralindeki yırtılmış kenarlar forseps yardımıyla tutularak, yırtık olmayan kısım gerdirilir. 15 no bistüri kullanılarak keseye insizyon yapılırken altındaki testiküler damarlar ve vas deferens'in yaralanmamasına dikkat edilir. Daha sonra ince doku forseps ve bistüri kullanılarak insizyonun proksimalindeki kese kenarları iç ringe doğru itilir ve kaldırılır. Proksimal kesenin tüm duvarları tek bir forseps içinde tutulur ve iç halka seviyesine kadar kremasterik liflerden ve kalan yapışıklıklardan nazikçe disseke edilir. Hastaların yaş ortalaması 13.9±18.1ay (aralık, 3 Hafta-7 yıl) idi. On yedi (%63) hasta inguinal herni ve 10 hasta (%37) inmemiş testis tanısı ile operasyona alınmıştı. Hastaların 7 (%25.9) tanesinde büyük kasık fıtığı kesesi mevcuttu. İntraoperatif ve postoperatif komplikasyon görülmedi. Bu yöntem, herniotomi sırasında fıtık kesesi yırtılan hastalarda kesenin daha fazla yırtılma riskini azaltan ve ameliyat süresini kısaltan güvenli ve etkili bir teknik olup vas deferens ve damarlara zarar vermemek için cerrahi büyüteç veya mikroskop kullanılarak da uygulanabilir.

**Anahtar Kelimeler:** Hidrocel, İnguinal Herni, İnmemiş Testis, Orşiopeksi, Processus Vaginalis

### Abstract

Tearing of hernial sac during giant inguinal hernia repair or orchiopexy presents a challenge to the pediatric surgeons, even in expert hands. We here describe a technique that is easy for performing high ligation in cases complicated with torn hernial sac. The steps of our incision technique is: Non-separated part was tightened with the help of forceps localized at the lateral aspects of teared sac. The incision to the sac was fashioned by scalpel No 15, while taking care to avoid injury to the underlying testicular vessels and vas deferens. Then, wound edges of the proximal hernia sac were moved forward by using fine tissue forceps and scalpel. The walls of proximal sac were totally grasped in one forceps and dissected gently from the remaining adhesions and cremasteric fibers up to the level of the internal ring. The mean age of the patients was 13.9±18.1 months (range 3 weeks-7 years). The diagnosis of the patients was inguinal hernia in 17 (63%) and undescended testis in 10 (37%). Seven (25,9%) of the patients had a large inguinal hernia sac. There were no intraoperative and postoperative complications. This is a safe and effective technique in patients complicated with torn hernial sac during herniotomy. It reduces the risk of further tearing of hernial sac. Short duration is another advantage. This technique can also be performed with using surgical loupe or microscope to care not to damage the vas and vessels.

**Keywords:** Hydrocele, Inguinal Hernia, Undescended Testis, Orchiopexy, Processus Vaginalis

### Introduction

Indirect inguinal hernia repair and orchiopexy are probably the most frequently performed surgical procedures in childhood throughout the world (1). Repairs of large inguinal hernia repair can be complicated with tearing of hernial sac; a factor associated with inguinal hernia recurrence. Furthermore, herniotomy is considered to be an effective part of a successful orchiopexy and helps prevent inguinal hernia in patients with undescended testis. Undescended testis with thin processus vaginalis present a challenge to the pediatric surgeons, even in expert hands. The presence of testicular vessels and vas deferens in close proximity to the peritoneum leads to tearing of hernial sac

during the dissection. We here describe a technique that is easy and effective for performing high ligation in cases complicated with torn processus vaginalis or hernial sac.

### Material and Method

The herniotomy was performed under general anesthesia with a caudal block for postoperative pain relief. A 1-2 cm long incision in the skin of the inguinal crease just lateral to the pubic tubercle is made followed by identification and incision of Scarpa's fascia. Dissection is then extended medially along inguinal ligament at the level of external oblique to identify the external ring. The ring is incised and the hernia sac, localized usually anteromedially to the cord is identified. The "white line," indicative of the margin of the sac, is grasped with clamps and the sac dissected bluntly from the adhesions, testicular vessels and vas deferens using fine tissue forceps.

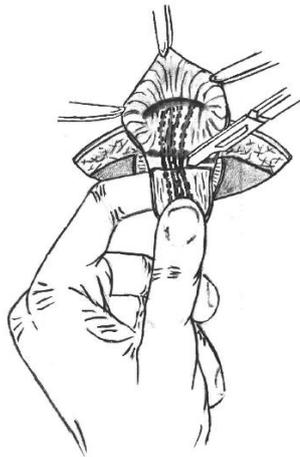
The processus vaginalis associated with cryptorchidism can be particularly thin and fragile or a large hernial sac can be difficult to dissect. It is possible to inadvertently tear the hernia sac at the level of connection between the sac and cord

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structures. If there is a tear at this stage, the non-separated part is grasped with forceps localized at the lateral aspect of torn sac. The incision to the sac is made with No. 15 blade scalpel, while taking care to avoid injury to the underlying testicular vessels and vas deferens (Figure 1). Then, wound edges of the proximal hernia sac are moved forward by using fine tissue forceps and scalpel (Figure 2). The wall of proximal sac is fully grasped in one forceps and gently dissected from the remaining adhesions and cremasteric fibers up to the level of the internal ring (Figure 3). Once the sac is confirmed to be empty, it is twisted on itself and a transfixion suture placed through it, followed by excision of redundant sac tissue. The incised aponeurosis of the external abdominal oblique muscle, Scarpa's fascia and skin are closed with absorbable sutures, respectively. Nonsteroidal analgesics are prescribed when required. All were discharged on the same operative day, except for patients less than 2 months of age, who were discharged on postoperative day 1 because of a risk of postoperative apnea. All patients were followed up by inguinoscrotal examination at 1 month, 3 months and 1 year postoperatively. This study had local ethical committee approval of the Mugla Sıtkı Kocman University Faculty of Medicine (2020/34) and was conducted in accordance with the Helsinki Declaration of 2013.

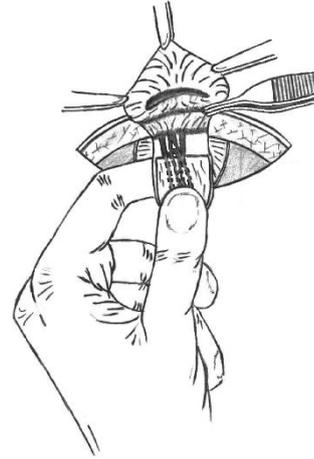


**Figure 1.** The incision to the sac is made with No. 15 blade scalpel, while taking care to avoid injury to the underlying vessels and vas.

## Results

This study is a retrospective review of 27 male patients where herniotomy were complicated with the tearing of hernia sac. All torn sacs were accomplished by the incision technique performed by the first author between August 2016 and July 2019. None of the cases included in the study had incarcerated hernia or nonpalpable testis. The mean age of the patients was  $13.9 \pm 18.1$  months (range 3 weeks-7 years). The diagnosis was inguinal hernia in

17 (63%) patients and undescended testis in 10 (37%). Seven (25,9%) of the patients had a large inguinal hernia sac. There was no intraoperative complication noted. We did not need to extend the wound in any of our cases. No postoperative complications including testicular atrophy, recurrent hernia and postoperative hydroceles occurred in the present study.



**Figure 2.** Wound edges of the proximal hernia sac are moved forward by using fine tissue forceps.



**Figure 3.** The wall of proximal sac is fully grasped in one forceps.

## Discussion

Indirect inguinal hernia is common in the pediatric age group. It is often congenital and arises from a patent processus vaginalis, a peritoneal channel that has failed to close and is also found in up to 90% of undescended testes (1-3). Although some surgeons suggested the nonligation of the processus vaginalis in the context of a indirect hernia and orchidopexy, their findings were based on limited evidence to be interpreted with suspicion

(4,5). On the other hand, failure to ligate the sac high enough at the internal ring has been reported as a factor leading to recurrences in open hernia repair (1). Traditionally, surgeons dissect the patent processus vaginalis from the testicular vessels and vas deferens, and ligate it at the level of internal ring with or without resection of the distal sac. High ligation was considered as essential to avoid recurrence of indirect inguinal hernia and is also the standard part of inguinal orchiopexy for patent processus vaginalis (1,6-8). Sonmez et al. demonstrated the importance of dissection and high ligation of processus vaginalis to prevent hernia formation and provide a tension-free orchidopexy procedure (2).

Children with large hernia present a challenge to the pediatric surgeon (9-11). The extensive hernia sac dissection from testicular vessels and vas deferens in such patients may lead to injury of these structures (12). Furthermore, the flimsy and thin hernial sac in premature children or in association with undescended testis is also technically difficult to dissect and prone to tearing. Traditionally, surgeons tunnel between the hernia sac and the cord structures using blunt dissection in order to accomplish the repair of torn sac. Then, they grasp and transect the proximal part of dissected hernia sac. After this procedure is repeated several times, the walls of hernia sac totally grasped in one forceps. Some authors named this procedure as Zig technique (13). We experienced that tearing continued up to the internal ring in some cases where we used this technique. We then had to perform extensive dissection extending over to the retroperitoneum or close the internal ring tight enough to allow the passage of cord structures only. Therefore, we have developed the described incision technique. Although we were concerned about the injury of testicular vessels and vas deferens in our first few cases, we did not encounter such complications and also any additional tearing up to the internal ring. Even so, we recommend gradual incision instead of deep incision to the wall of patent processus vaginalis until the surgeon becomes experienced. This technique can also be performed with using surgical loupe or microscope to avoid damage to the vas and vessels.

Shorter operation duration is another advantage of this incision technique. Although we did not keep time, we observed that our technique was performed in a shorter time than classical zig technique.

## Conclusion

Incision of torn patent processus vaginalis is a simple, safe and effective technique that does not

require any additional dissection or maneuver. From present experience, the applicability of the technique has been tested in patients with indirect inguinal hernia and undescended testis, but we believe that it may also be used in hydrocele repair. Further research involving prospective studies with larger patient samples will allow us to evaluate the operative time and results of our technique.

## Conflict of interest statement

None.

**Ethics Committee Approval:** This study had local ethical committee approval of the Mugla Sıtkı Kocman University Faculty of Medicine (2020/34) and was conducted in accordance with the Helsinki Declaration of 2013.

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