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Operative Techniques

# Introducing a new scrotal orchiopexy technique: The fat anchor orchiopexy

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ABSTRACT

Cryptorchidism is the most common congenital anomaly of the male genital tract. Cryptorchidism is associated with potentially serious consequences including reduced fertility, increases risk of cancer, susceptibility to torsion and traumatic injury, as well as future psychological problems related to an abnormal scrotal appearance. The mainstay of orchiopexy is to achieve an adequate tension-free and permanent scrotal fixation of the testis; one that prevents recurrent ascent. A number of suggestions have been made regarding keeping the testis in the scrotal position once it was brought down in the scrotum without tension. Several techniques for testicular fixation have been described to date; however, the optimal method remains controversial.

We herein introduce a novel scrotal orchidopexy technique. This innovative fixation technique utilizes the sub-scrotal fat as a permanent anchor for fixing the low-lying cryptorchid testicle in the scrotum through a trans-scrotal incision. Therefore, the procedure was named “the fat anchor orchiopexy”. We believe our method will give better options for scrotal fixation especially in cases of low-lying cryptorchid testes. This article provides a detailed description of this new fixation technique.



## 1. Introduction

Cryptorchidism is the medical term that describes failure of one or both testicles to descend to the normal scrotal position. It is the most common congenital anomaly of the male genital tract with a prevalence rate of ~5% among full-term infants and ~30% among premature infants [1]. Most cases resolve during the first few months after birth, and only 1% of male infants continue to have undescended testes over three months of age [2]. *Re*-establishing normal testicular location in the scrotum has important implications including reducing risk of malignancy, preserving fertility, reducing the risk of complications, and restoring normal genital appearance [3–5].

The mainstay of orchiopexy is to achieve tension free mobilization of the testis and the spermatic cord and adequate permanent scrotal fixation of the testis; one that prevents recurrent testicular ascent [6]. Inguinal orchiopexy is a well-established procedure that has been commonly regarded as the standard of care for cryptorchidism [7]. Orchiopexy could alternatively be performed through a less invasive single-incision scrotal approach for testes that are palpable or are distal to the external inguinal ring, therefore accessible through a single scrotal incision [8]. The optimal method of fixation remains controversial. Classic transfixation orchiopexy, involving transfixation of the testicular wall at two different points onto the dartos fascia, scarification, the "window" technique are all common methods of fixation of the testes in a scrotal position [9,10] A modified extra dartos pouch technique has also been reported by Ghnnam et al. [11]. This article is a preliminary report of a new and reliable method of testicular fixation that utilizes the sub-scrotal fat as a permanent anchor for the testis. Therefore, this innovative technique was called “the fat anchor orchiopexy”.

## 2. Fat anchor orchiopexy (FAO)

### 2.1. Preprocedural settings

The procedure is performed under general anesthesia with the patient in the supine position. The resting position of the testis is assessed while the patient is anesthetized, and the extent to which the testis could be massaged into the scrotum is evaluated further confirming the diagnosis of cryptorchidism.

### 2.2. operative technique (executional steps)

The testis is massaged down into the most caudal extent of the scrotum. A transverse scrotal incision is then made above the testicular bulge though which the testicle is exposed and delivered. The spermatic fascia covering is then meticulously dissected free

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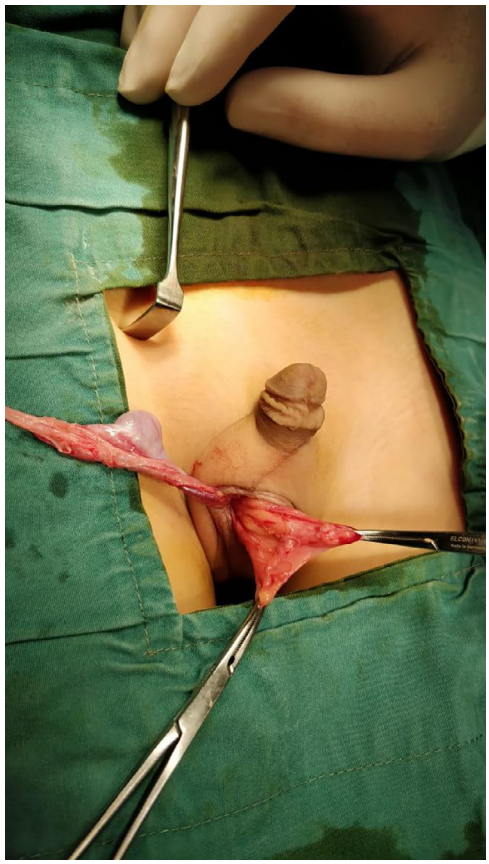

**Fig. 1.** Separation of the spermatic cord from the sub-scrotal fat.

**Fig. 2.** The testis is passed through the sub-scrotal fat pad.

from its surrounding fat pad. This pad of fat represents a continuation of the superficial fascia covering the anterior abdominal wall (Fig. 1). The spermatic fascia covering and cremasteric muscle are incised and separated from the vas deferens and spermatic vessels, which are identified and preserved. The processus vaginalis is identified if possible, dissected, and ligated high, as would be done for conventional herniotomy. Once the testis is mobilized to its normal position free of tension, a keyhole is made through the mid portion of the fat pad and the testis is passed through it using an Overholt clamp (Fig. 2). The neck of the keyhole incision in the fat pad can be plicated, if required, to prevent testicular reascent. An ipsilateral subdartos pouch is then created, and the testis is placed within it. Finally, the scrotal wound is closed with 5/0 non-absorbable sutures (Fig. 3).

## 3. Discussion

Numerous suggestions were made in regards to keeping the testes in place after it was brought down into the scrotum [12]. In 1927, Ombredonne introduced fixing the testes into the contralateral scrotal pouch through a window in the scrotal septum [13]. Cabot and Nesbit anchored the testes to the contralateral thigh using a rubber band attached to a silk suture [14]. Suturing the testis to the fascia of the thigh was also suggested by Torek in 1931 [15]. Later on, fixing the testes was done through an established plane between the dartos fascia and the scrotal skin which placed the testis in a subcutaneous position and this became the standard of care, this was first described by Shoemaker and later popularized by Lattimer [16,17]. The incorporation of the sub-scrotal fat in fixing the testes inside the scrotum was first suggested by CS; one of the contributing authors to this manuscript. From an anatomical aspect the scrotum is a continuation of the anterior abdominal

**Fig. 3.** The final position of the testes in the scrotum.

wall. The layers surrounding the testes and comprising the layers of the scrotum are analogous to the layers of the abdominal wall which formed as a product of descent of the testes through the inguinal canal [18]. The sub-scrotal fat originates from the layers of the superficial fascia of the anterior abdominal wall, which extend down medially beyond the pubic symphysis and joins together to form the dartos tunic of the scrotum [19].

In our experience, we have operated on 18 patients, all between 1 and 3 years of age. We utilized the fat pad as an anchoring mechanism through a trans-scrotal access in all of our cases. We followed our patients for a mean of 13 months (8–17 months) and we report no testicular retraction, reascent or testicular atrophy. Our innovative technique utilizes the sub-scrotal fatty fascial layer, after careful separation from the fascia covering the testes and spermatic cord, in anchoring the cryptorchid testes. We believe that this gives the testes additional support especially when testicular reascent is in question, this also could give surgeons an additional option when considering intra-scrotal testicular placement and fixation. Several studies have reported on the success rate of the different types of orchiopexy. Operative success is still defined as a testis that remains in the scrotum and does not atrophy, measured mainly by clinical evaluation [20]. Docimo SG reviewed the literature to consolidate the different success rates reported for orchiopexy in 1995. A total of 64 articles were reviewed, and found to contain variable success rates depending on primary testicular position and type of procedure performed [20]. The subscrotal fat could also be utilized when operating through the tansinguinal approach as it may benefit it keeping the testes in the scrotal pouch especially when dealing with a high undescended testes and additional tension on the repair.

## 4. Conclusion

Anchoring the testes through the sub-scrotal fat pad could prove as an important alternative or addition to conventional methods especially when testicular reascent is of concern. Further comparative studies are necessary to help assess long term outcomes and benefits of this procedure.

## Disclosure

The authors have no financial ties or conflicts of interest to declare

## Type of study

Technique article

## Author contributions

KA, SB and CS all contributed to the study concept and design, drafting, final approval, and accountability for all aspects of the work

## Data availability statement

Not applicable for this type of article.

## Compliance with ethical standards

*Research involving human participants or animals*

**Ethical approval:** Ethical committee approval was obtained.

## Informed consent

Informed consent is not applicable to this type of articles.

## Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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