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**Collagen fleece (Tachosil®) for treating testis torsion: A case report and review of literature**

Collagen fleece for treating testis torsion

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## **Abstract**

### **BACKGROUND**

Testicular torsion is an emergent disease in urology, and there has been discussion of the treatment of testicular torsion. Testicular decompression has been established as a critical treatment for testicular compartment syndrome (TCS), which occurs after detorsion in a patient who is diagnosed with testis torsion. Until now, testicular fasciotomy and incision of tunica albuginea with tunica vaginalis flap graft have been suggested for decompression, and some studies about the efficacy of tunica vaginalis flap were reported. But this method is time consuming and needs meticulous technique, so other methods such as orchio-septopexy are suggested. The objective of this clinical case report was to propose new surgical method using collagen fleece (tachosil®) instead of tunica vagina flap.

### **CASE SUMMARY**

A 5-year-old boy with scrotal pain visited our hospital after 24 h from symptom onset. After history taking, physical examination, and the scrotum ultrasonography, he was diagnosed with testis torsion. Emergency surgery was performed after diagnosis. After the incision of scrotum and fasciotomy, we covered his tunica albuginea with collagen fleece called tachosil® instead of covering with tunica vaginalis flap.

### **CONCLUSION**

Short-term follow showed normal blood flow in testis without a testicular compartment syndrome. This is the first case report of using tachosil® in testicular torsion surgery, and its advantages were already reported in other surgeries like peyronie's disease. Our case suggests this new technique is an appropriate method because of its advantages including its cost-effective and time-saving characteristics. The main limitation is the short follow-up, so more studies are needed to provide a high level of evidence about its efficacy and safety.

**Key Words:** Case report; Testicular torsion; Testicular compartment syndrome; Collagen fleece; Tachosil®

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**Core Tip:** Testicular torsion is an emergent disease in urology which should be treated quickly as soon as possible. Its treatment is detorsion and orchiopexy. But fasciotomy has been suggested because this treatment is effective for testicular decompression, and it could prevent testicular compartment syndrome. Fasciotomy with tunica vaginalis flap coverage has been reported. Now, we suggest new method with collagen fleece.

## INTRODUCTION

Testicular torsion is a common emergent disease in urology. It should be treated as quickly as possible. It is a common cause of acute scrotum, which refers to the constellation of new onset of pain, swelling, and/or tenderness of intrascrotal contents [1]. Torsion of the appendix testis is the most common diagnosis (40% to 60%) in acute scrotum, followed by spermatic cord torsion (20% to 30% excluding neonates), epididymitis (5% to 15%), and others or no pathology (10%) [1].

Testicular torsion occurs when a testis rotates, twisting the spermatic cord that brings blood to the scrotum. This can lead to testicular ischemia or infarction if there is a delay in presentation for medical attention. Testis torsion is time sensitive to ischemia. The rate of orchiectomy can reach 80% to 90% when ischemia time exceeds 24 h [2]. Thus, it is essential to perform urgent surgical exploration in all cases of testicular torsion within 24 h of symptom onset [3].

Traditionally, orchiopexy has been established as the standard treatment for testis torsion when the testis color changes to normal color after detorsion. Orchiectomy could be considered if testis does not return to normal after detorsion and the affected testicle appears grossly necrotic or nonviable [4]. And It has been suggested that

testicular torsion may include an element of compartment syndrome [5]. Decompression of compartment syndrome is known to salvage tissues in numerous organ systems [6].

Especially, tunica albuginea incision with tunica vaginalis flap coverage has been suggested as a promising option for managing clinically marginal torsed testes and enhancing salvageability after prolonged ischemia before performing orchiectomy in selected cases of testicular torsion [5]. Testicular fasciotomy combined with tunica vaginalis flap has been reported as a method to relieve testicular compartment syndrome [6]. However, it is time-consuming. It is also associated with bleeding, especially if scrotal edema and inflammatory reaction are present. Therefore, other methods such as orchio-septopexy as alternative techniques have been reported [2].

To improve salvage rates, we used collagen fleece called tachosil® instead of using tunica vaginalis flap. Tachosil® is a medicated sponge coated with human fibrinogen and human thrombin. It can improve hemostasis, promote tissue sealing, and support sutures when standard surgical techniques are insufficient [7].

Although there are some case reports with fasciotomy using tunica vaginalis in case of testis torsion, there has been no case report of surgery using tachosil®. Here we report the first case of using tachosil® for treating testis torsion.

## **CASE PRESENTATION**

### ***Chief complaints***

A 5-year-old boy who presented with pain migration from abdomen to scrotum visited our urology department.

### ***History of present illness***

He had already visited our emergency room with a symptom of intermittent abdominal pain two days before he visited our urology department. He only had abdominal pain at that time without showing specific symptoms like nausea, vomiting, fever, or others. Pediatric doctors suspected acute gastroenteritis and intussusception. To rule out intussusception, he underwent a bowel ultrasound. However, there was no specific

finding. After he went home, he still complained of his abdominal pain. The pain of scrotum then started.

#### ***History of past illness***

He had no specific disease history, and no medication history except pediatric asthma.

#### ***Personal and family history***

He had no family history, and no personal history.

#### ***Physical examination***

On physical examination, there was no prehn's sign or cremasteric reflex.

#### ***Laboratory examinations***

Lab results showed no specific findings

#### ***Imaging examinations***

With a suspicion of testicular torsion and epididymitis, we performed a scrotal ultrasound for diagnosis of testicular torsion.

### **FINAL DIAGNOSIS**

Scrotal doppler ultrasound demonstrated a heterogenous hypoechogenicity with decreased vascularity in the left testis indicating "left testicular torsion"(Figure 1).

### **TREATMENT**

Even though 24 h have passed from the symptom onset and poor prognosis was expected, there was no other treatment except surgery. Thus, we decided to perform "immediate surgical exploration" as a treatment for testicular torsion.

The patient was placed in a supine position under general anesthesia. He was dressed using bethadine and draped before the surgery. The scrotum was explored *via* midline incision and the soft tissue was dissected. We opened the tunica vaginalis and delivered

the testis. The left testis had counter clockwise torsion, and we performed detorsion. The dark color of the testis remained. It might indicate an ischemic state. Fasciotomy was performed to make decompression. For coverage of tunical albuginea (Figure 1), we used 7.5 cm<sup>2</sup> (3cm\*2.5cm\*0.5cm) tachosil® which consisted of fibrinogen and thrombin. It was made by Takeda Pharmaceutical Company for covering the testis. Operation took 1 h.

### **OUTCOME AND FOLLOW-UP**

Patient felt no more pain after surgery. Scrotal ultrasonography was performed at 2 days and 16 days after surgery. Blood flow in the left testis was confirmed (Figure 2). After 3 mo, the patient and their parents came hospital for follow up, and although scrotal ultrasonography were not performed, there were no abnormal findings in the physical examination, and the patient had no symptom during 3 mo.

### **DISCUSSION**

In case of testicular torsion, restoration of blood flow to the ischemic testis should be performed promptly [4]. Two methods are generally used: manual detorsion and surgical exploration.

Manual detorsion should be attempted before surgical exploration or preparation of surgery. It could relieve symptoms and allow delayed orchidopexy [1]. However, it should not supersede or delay the surgical exploration [4]. Orchiopexy should be performed if the affected testis seems viable [4]. Orchiectomy could be performed if the affected testicle appears grossly necrotic or nonviable [4]. The contralateral testis should be fixed with nonabsorbable suture to reduce the risk of metachronous torsion [8].

After detorsion, irreversible cellular damage may occur due to edema and increased intratesticular pressure caused by reperfusion damage [9]. Because the testis is surrounded by its relatively inelastic tunica albuginea, edema in this confined space could increase 'testicular compartment' pressure with decreased perfusion to the testis

and further ischemic injury even after the spermatic cord is untwisted [10]. This concept called "testicular compartment syndrome (TCS)" was proposed by a Philadelphia group in 2008 [10].

To manage testicular compartment syndrome, testicular fasciotomy and incising the tunica albuginea with a tunica vaginalis graft have been suggested. They can prevent high intratesticular compartment pressure and maintain low compartment pressure inside the testis. We can see studies about TCS (Table 1). However, harvesting the flap is meticulous, tedious, and time consuming. Thus, other methods such as orchio-septopexy have been suggested as alternatives [2].

We used tachosil® instead of covering with tunica vaginalis flap because of its utility. It consists of two layers, namely one collagenous layer and a layer containing fibrinogen and human thrombin [11]. One well-designed study showed that tachosil® was significantly superior compared with standard suturing in obtaining intraoperative control of hemorrhaging [12].

Tachosil® is indicated not only for hemostasis, but also for tissue sealing. It can support sutures, prevent adhesions and erosions, and so on [11]. Surgeries using Tachosil® and its efficacies for other diseases of urology have already been reported. For example, many advantages have been reported in surgery of peyronie's disease like self-adhesive properties, decreased operative time, minimal risk of contraction compared to other grafting materials, hemostatic effect, hemostatic effect and cost effect [13].

An important point of our case was that surgery was performed after 24 h of symptom onset. Thus, if time has exceeded 24 h from symptom onset, we can still save the testis if we proceed with an operation promptly. Tachosil® could be the best choice in an urgent moment because it could decrease the time of surgery.

However, this case report has some limitations. The main limitation is the short follow-up. Despite prompt diagnosis and surgery, infertility remains a major issue after treatment of testicular torsion [14]. Randomized, comparative trials and long-term studies that evaluate the use of similar graft are necessary in the future.



## **CONCLUSION**

Collagen fleece could be an appropriate choice in testis torsion surgery because it could decrease surgery time. More studies are needed to provide a high level of evidence about its efficacy and safety.

## **ACKNOWLEDGEMENTS**

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