

ORIGINAL ARTICLE

Detorsion Plus Tunica Vaginalis Flap Coverage in the Management of Ischemic Testis Following Torsion: Experience in Dhaka Shishu (Children) Hospital

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Abstract

Background: Testicular torsion leads to devastating consequences in young boys, about 42% undergo an Orchiectomy resulting in reduced fertility, testicular hormonal dysfunction and psychological trauma.

Objective: The aim was to evaluate the testicular salvage rate after detorsion plus tunica albuginea incision with tunica vaginalis flap coverage with orchiopexy.

Methods: This was an observational study conducted from January 2016 to December 2017. Data were collected from operation theater and surgery ward register. Data were analyzed using SPSS version 20 statistical software. Continuous data were presented as mean \pm SD and categorical data were presented as percentage.

Results: Total numbers of patients were 15. Most of the patients presented after 24 hours. Rate of atrophy of testis after orchiopexy was higher in patients presented after 24 hours. Only 4 patients had recognizable testicular atrophy. Surgical site infection was not present in this study.

Conclusion: Tunica albuginea incision with tunica vaginalis flap coverage after detorsion with orchiopexy provides more salvage rate in the management of ischemic testis following torsion.

Key words: Torsion testis, compartment syndrome, fasciotomy, testicular atrophy.

Introduction

Testicular torsion is the twisting of spermatic cord and its contents. This surgical emergency affects 3.8 per 100,000 males younger than 18 years every year.¹ It constitutes 10% to 15% of acute scrotal disease in children and around 42% of these boys need orchiectomy.² Prompt recognition and treatment are most crucial for testicular salvage and torsion must be excluded in all patients who present with acute scrotum. Delay in the treatment of torsion

results in substantial tissue damage or even complete necrosis of the testicle. In unilateral torsion also the contralateral testicle may be damaged, most probably by ischemic reperfusion injury.³

The standard operative management of testicular torsion includes detorsion followed by orchiopexy or orchiectomy depending on the subjective gross viability of the testicular parenchyma.⁴ Orchiectomy can result in reduced fertility, testicular hormonal dysfunction and psychological trauma.^{1,5}

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Kolbe et al⁶ introduced the idea of a compartment-like syndrome in an animal study. Conceptually the testicle is an organ at risk because of the characteristics of the tunica albuginea, a fairly strong and inelastic layer. A limited case series suggested that decompression of the tunica albuginea in humans may be beneficial in the reperfusion of the testicular parenchyma after detorsion, despite the lack of similar evidence in animal studies.^{6,7} Kutikov et al⁸ suggested that post-detorsion compartment syndrome (i.e., testicular compartment syndrome) may be amenable to decompression by generous incision of the tunica albuginea or fasciotomy. Based on those results Figueroa et al⁴ introduced the tunica albuginea incision followed by tunica vaginalis flap coverage as a therapeutic alternative for testes that remain grossly ischemic after detorsion. In their study, they have shown that this intervention increases the testicular salvage rate with a consequent decrease in the number of orchiectomy.

This study was undertaken to evaluate the testicular salvage rate after detorsion and tunica albuginea incision with tunica vaginalis flap coverage and orchiopexy.

Materials and Methods

This was an observational study conducted from January 2016 to December 2017. Patients with ischemic testis following torsion confirmed preoperatively by bluish discoloration of testis were included.

Ethical clearance was taken from ethical committee of Bangladesh Institute of Child Health & Dhaka Shishu (Children) Hospital. Informed written consent was taken from all the parents or legal guardians of the patients after adequately explaining them, the purpose of the study. They were assured of protection of patients' autonomy, privacy, confidentiality.

After detorsion the affected testis was wrapped in warm saline soaked gauze. Attention was then directed to the contralateral testis, which was evaluated and orchiopexy done prophylactically to prevent future torsion. The affected testis was then reevaluated after a period of observation, color and appearance was noted, a generous longitudinal anterior incision of the tunica albuginea was made. The gross enhancement in parenchymal blood flow was observed, the defect of the albuginea was covered with a vascularized tunica vaginalis flap and the gonad was fixed. The scrotal skin was closed with interrupted sutures (Fig 1).

Patients attended the Pediatric Surgery operation theater at 2 week, 3 months and 6 months after operation. In each visit patients were assessed clinically for the followings:

At 2 weeks after operation: Scrotal hematoma, surgical site infection, Doppler USG to examine the testicular blood flow.

After 3 months of operation: Condition of the testis by USG.

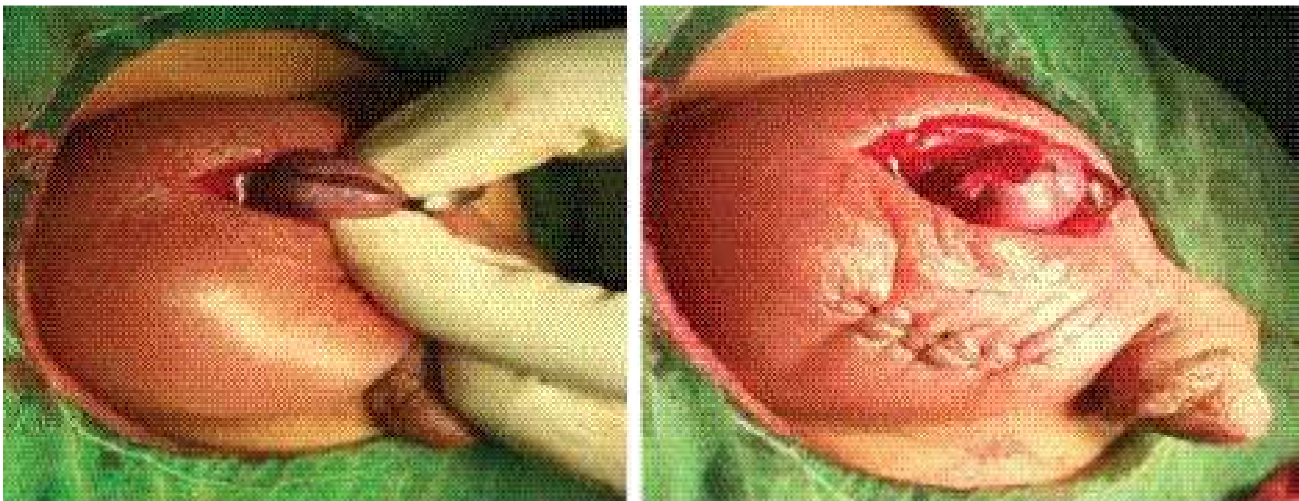


Fig 1 *Tunica albuginea incision with tunica vaginalis flap coverage*

After 6 months of operation: Doppler USG, Testicular blood flow, Testicular atrophy.

The statistical analysis was conducted using SPSS (statistical package for social science) version 20. The findings of the study were presented by frequency, percentage in tables. Means and standard deviations for continuous variables and frequency distributions for categorical variables were used to describe the characteristics of the total sample.

Results

Total number of patients was 15. Mean age, mean weight, involved site and type of torsion showed (Table I). Only 4 patients presented within 24 hours, while most of the patients presented after 24 hours (Table II). Rate of atrophy of testis after orchiopexy was higher in patients presented after 24 hours. Only 4 patients had recognizable testicular atrophy. No surgical site infection was present (Table III).

Table I
Comparison of independent variables of the participants (n=15)

Variables	(n=15)
Age (in months)	44.60 ± 47.53
Weight (in kg)	15.01 ± 13.32
Involved side	R-5, L-10
Type of torsion	Intra vaginal-14 Extravaginal-1

Table II
Comparison of duration of torsion of the participants (n=15)

Duration (hours)	No. (%)
Less than 24 hours	4 (26.7)
Within 24 to 48 hours	4 (26.7)
After 48 hours	7 (46.7)

Table III
Comparison of testicular atrophy and surgical site infection (n=15)

Comparison	No. (%)	
Testicular atrophy	Absent	11 (73.3)
	Present	4 (26.7)
Surgical site infection	Absent	15 (100.0)
	Present	0(00.0)

Discussion

Testis-preserving surgery may have testicular function if the testis is not obviously necrotic. Testicular torsion does not necessarily cause the circulation to cease completely and preserving surgery can also sometimes be attempted after delayed diagnosis.⁹

The present study addressed the increase testicular salvage rate after detorsion and tunica albuginea incision with tunica vaginalis flap coverage with orchiopexy.

In this study, the mean duration from torsion to operation time was more than other study as patients from all over the country come for better treatment as it is the largest children hospital. It is the problem of the socioeconomic condition of a developing country like Bangladesh. There is always a delay in seeking of appropriate medical care. This study again proved that time is crucial for this urological emergency, since pain lasting more than 4-8 hours is highly associated with testicular death if no intervention occurs.¹⁰ The surgical technique as described by Kutikov et al⁸ was performed in 15 patients. Tunica vaginalis patch was sewn to the tunica albuginea after “testicular fasciotomy” to decrease the intratesticular pressures and to preserve perfusion of the testis. No patient developed scrotal haematoma and skin infection within 6 months follow up.

Testicular atrophy is a significant complication in patients who undergo salvage procedures for testicular torsion.¹¹ Here testicular size was measured by ultrasonography (USG). In this study no patients developed atrophy that was explored within 24 hours. In adolescent boys, necrosis is likely after 24 hours of symptoms.¹² The rate of atrophy was more in patients who had duration of torsion more than 48 hours as percentage of testicular salvage rate decreases with time passes from onset of symptoms to surgical.⁴

Figuroa et al⁴ retrospectively reviewed all cases of acute scrotal pathology that underwent surgical exploration during a 10-year period. They compared the salvage rate between detorsion alone versus detorsion and tunica albuginea decompression (fasciotomy) with tunica vaginalis flap coverage in the surgical management of prolonged testicular ischemia. They found no statistical differences between the two groups regarding salvage rate. In

their study, there were significant statistical differences in duration of torsion 31.2 hours in tunica albuginea incision plus tunica vaginalis flap coverage. In this study, the sample size in tunica albuginea incision plus tunica vaginalis flap coverage group was 15 in 2 years.

Conclusion

Testicular torsion is an important and frequent condition affecting the male child population, with it there is a significant risk for testicular loss and possible impact on fertility. Tunica albuginea incision with tunica vaginalis flap coverage with orchiopexy provides more salvage rate in the management of ischemic testis following torsion.

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