

Unilateral Orchiectomy and Its Impact on Male Fertility: A Retrospective Study of Testicular Trauma Patients

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ABSTRACT

Background: Testicular injury has been shown to occur in less than 1% of trauma.

Objective: To evaluate the fertility of patients underwent unilateral orchiectomy and live with unilateral testis.

Materials and method: In this retrospective study, 86 male trauma patients that admitted to Alsadi hospital and Hatroom Urology Center between January 2015 to December 2018 were studied. All patients underwent unilateral orchiectomy. Married patients were included in this study. Information was collected from the medical records of the patients. The following parameters were included: patient age (years), injury type (blunt vs penetrating), mechanism of injury, conceive and period of conceive after orchiectomy. SPSS program, version 22, was used to analyze the data. The data were tabulated and statistical analysis was done by estimating rates, means and standard deviations, Fisher test was used and p-value < 0.05 was considered as statistically significant.

Results: The total study patients were 86. Their age at orchiectomy ranged between 20 – 35 and the mean age was 27 ± 4.3 years.

Blunt trauma accounted for (79.1%), while penetrating trauma accounted for (20.9%).

The causes were vehicle accident (25.6%), gunshot wounds (20.9%), pedestrian collision (18.6%), sport trauma (15.1%), work site (10.5%), and motor collision (9.3%).

Most of unilateral orchiectomy men succeeded to conceive (73.3) while (26.7%) failed to

conceive ($p > 0.05$). After 1 year (27.9%) occurred conceive then after 2 years (23.2%) occurred conceive and after 3 years (22.2%), ($p < 0.05$).

Conclusion: The total study patients who underwent orchiectomy were 86. Blunt trauma was predominant. The causes of the testicular trauma were vehicle accident, gunshot wounds, pedestrian collision, sport trauma, and motor collision. We found the most of unilateral orchiectomy men succeeded to conceive. Further studies are in need.

Key words: Unilateral orchiectomy, male fertility, testicular trauma, Aden, Yemen

INTRODUCTION

Published studies reported that genitourinary injury is present in approximately 10% of cases of abdominal trauma and of those genitourinary injury, up to 67% involve the external genitalia [1-3]. Kitrey et al [2] mentioned in their study, that genitourinary injuries are more common in males, especially in the instance of genital injury.

Wein et al [4] in their published book pointed out that the lower urinary tract is susceptible to traumatic injury by way of various mechanisms. These injuries, and their sequelae, can affect patients of any age or background. Though lower urinary tract trauma rarely results in life-threatening

pathology, appropriate management of these injuries is pivotal in decreasing long-term morbidity.

The external genitalia in males are at high risk of injury in trauma because of their extracorporeal location, the scrotum and testes are relatively well-protected from severe damage [4-6].

Testicular injuries can be classified aetiologically as blunt, penetrating or degloving. Blunt testicular trauma accounts for the majority of cases, typically affecting males aged 15–40 years of age [7].

Previous published studies [5,8] mentioned that testicular injury has been shown to occur in less than 1% of trauma. Rombaut et al [9] reported in their published study, that studies concerning a unilateral orchiectomy in pre-pubertal boys are non-existent and those in adult men are limited and divergent. The effect on the endocrine parameters and the semen quality of patients who underwent orchiectomy after unilateral testicular injury was studied.

Objective: To evaluate the fertility of patients underwent unilateral orchiectomy and live with unilateral testis.

MATERIALS AND METHOD

In this retrospective study, 86 male trauma patients that admitted to Alsadi hospital and Hatroom Urology Center between January 2015 to December 2018 were studied. All patients underwent surgical procedure of one *testicle orchiectomy*. Married patients were included in this study. Information was collected from the medical records of the patients. The following parameters were included: patient age (years), injury type

(blunt vs penetrating), mechanism of injury, conceive and period of conceive after orchiectomy. SPSS program, version 22, was used to analyze the data. The data were tabulated and statistical analysis was done by estimating rates, means and standard deviations, Fisher test was used and p-value < 0.05 was considered as statistically significant.

RESULTS

Table 1 and Figure 1 showed that the total study patients were 86. Their age at orchiectomy ranged between 20 – 35 and the mean age was 27 ± 4.3 years.

Blunt trauma accounted for 68 (79.1%) of the total study patients, while penetrating trauma accounted for 18 (20.9%).

The table illustrated the causes of the testicular trauma in our study. There was vehicle accident 22 (25.6%), gunshot wounds 18 (20.9%), pedestrian collision 16 (18.6%), sport trauma 13 (15.1%), work site 9 (10.5%), and motor collision 8 (9.3%).

Table 1: Distribution of ages and causes of affected testis (n = 86)

Variables	No	%
Age groups (years):		
≤ 25	40	46.5
> 25	46	53.5
Total	86	100
Age range (years):	20 – 35	
Mean age at orchiectomy (years):	27 ± 4.3	
Type of injury:		
Blunt trauma	68	79.1
Penetrating trauma	18	20.9
Causes of testicular trauma:		
Vehicle accident	22	25.6
Gunshot wounds	18	20.9
Pedestrian collision	16	18.6
Sport trauma	13	15.1
Work site	9	10.5
Motor collision	8	9.3
Total	86	100

Figure 1: Proportions of age groups and variables related to testicular trauma

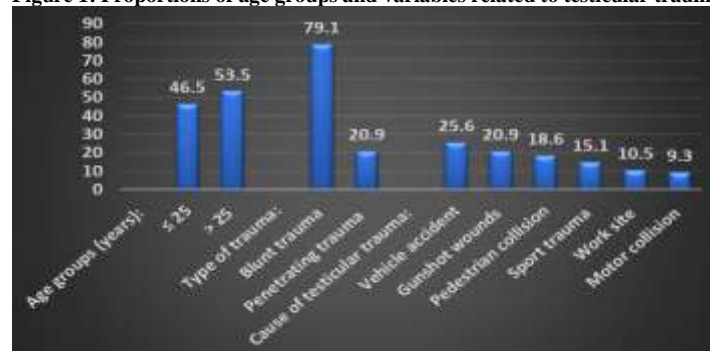


Table 2 revealed the distribution of various variables related to age groups. Most of unilateral orchiectomy men their wives conceived 63 (73.3) while 23 (26.7%) their wives failed to get pregnant ($p > 0.05$), as shown in Table 2 and Figure 2.

Period of conceive after orchiectomy summarized in Table 2 and Figure 3. After 1 year 24 (27.9%) occurred conceive then after 2 years 20 (23.2%) occurred conceive and after 3 years 19 (22.2%). there was relation between values ($p < 0.05$).

Table 2: Distribution of various variables related to age groups

Variables	Age groups (years)		Total	p-value		
	≤ 25	> 25				
	No	(%)	No	(%)		
<i>Conceive</i>						
Yes	31	(36.0)	32	(37.2)	0.280	
No	9	(10.5)	14	(16.3)		
Total	40	(46.5)	46	(53.5)		
<i>Pc orchiectomy:</i>					0.033	
After 1 year	10	(11.6)	14	(16.3)		
After 2 years	10	(11.6)	10	(11.6)		
After 3 years	11	(12.8)	8	(9.3)		
None conceive	9	(10.5)	14	(16.3)		
Total	40	(46.5)	46	(53.5)	86	(100)

Pc orchiectomy = Period of conceive after orchiectomy:

Figure 2: Proportions of Conceive in both age groups and total patients

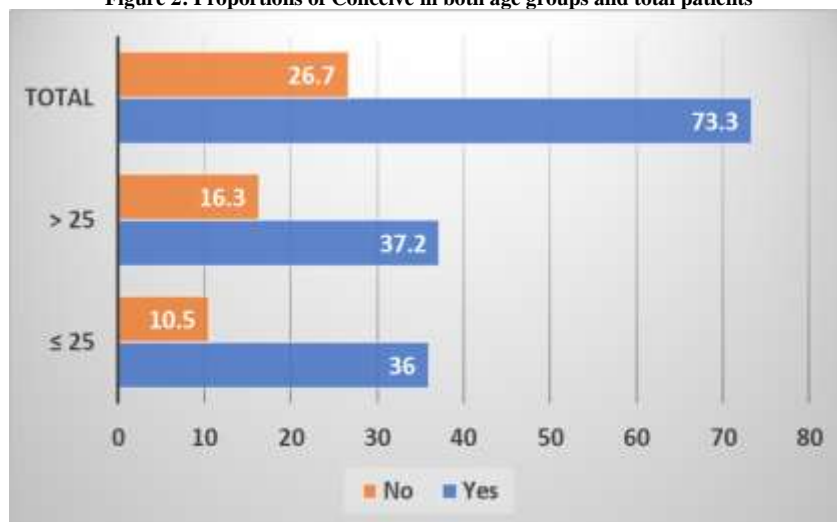
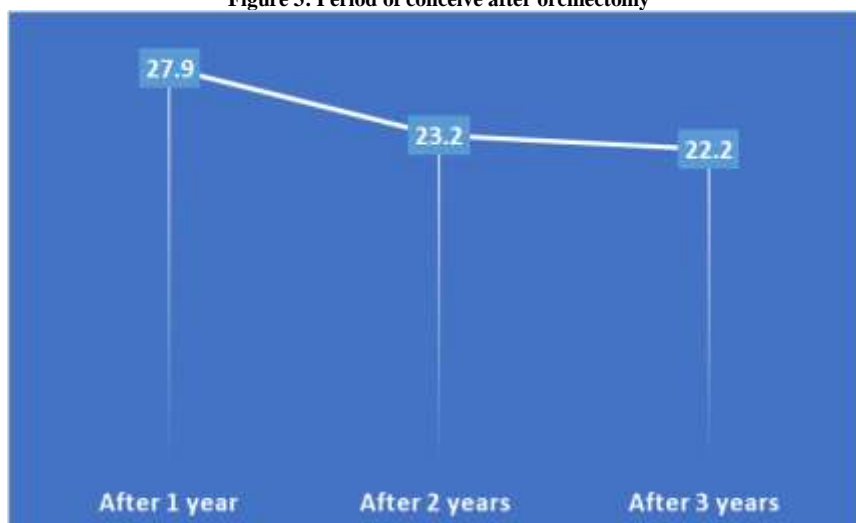


Figure 3: Period of conceive after orchiectomy



DISCUSSION

This increased incidence in males is secondary to both anatomical considerations and increased participation in activities such as contact sports, violent interaction, and war activities [2].

The lower urinary tract is susceptible to traumatic injury by way of various mechanisms. These injuries, and their sequelae, can affect patients of any age or background. Though lower urinary tract trauma rarely results in life-threatening pathology, appropriate management of these injuries is pivotal in decreasing long-term morbidity [4].

Testicular injuries are seldom between the injuries of the genitourinary tract because of the protection offered to them by their anatomical position between the thighs and because of their mobility. Males between 15 and 40 years of age represent the most frequently affected group [10].

The cremasteric reflex, testicular mobility, and the strength of the tunica albuginea all contribute to making testicular trauma uncommon [11].

Testicular rupture is a rare but serious injury that is characterized by a rip or tear in the tunica albuginea resulting in extravasation of seminiferous tubules. The right testis is injured more often than the left one, because of its greater propensity to be trapped against the pubis or inner thigh [12]. A study revealed that a 50 kg direct force is required to cause testicular rupture [11]. Severity may vary from a small laceration with minimal extravasation to complete parenchymal destruction [12].

Previously reported rates of testicular injury with sports participation may underestimate the prevalence of these injuries among adolescent and young adult athletes among whom testicular protective equipment is infrequently used. Any kind of contact sport, without the use of protective aids, may be associated with genital trauma [13,14].

Bocchi et al [15] mentioned that the scrotum is relatively protected from severe damage due to its inherent mobility and the presence

of the cremasteric reflex and tunica albuginea. The incidence of scrotal or testicular injury in trauma is <1%, and while it is generally not life threatening, prompt diagnosis and appropriate management are critical to prevent morbidity [16,17,18].

The American Urological Association recommends early scrotal exploration in all patients suspected of testicular rupture to prevent testicular loss, infection, chronic pain, infertility, and altered self-image [3].

In the present study, the total study patients who underwent orchiectomy were 86. Their age at orchiectomy ranged between 17 to 35 years and the mean age was 25.2 ± 5.9 years.

Mitchell et al [19] reported in their study that over 34,000 male trauma patients were reviewed, and 23 (0.07%) were found to have traumatic testicular injuries (TTI). The age range of patient's studied was 3-69 years. The mean age of men in their study was 29.4 years.

In our present study, we found blunt trauma accounted for (79.1%) of the total study patients, while penetrating trauma accounted for (20.9%).

According to the etiology testicular injuries are separated in blunt and penetrating, the first being the most common. Blunt testicular injuries can occur during sport activities especially full contact sports, assaults or traffic accidents mostly on bicycles and motorbikes. In most cases only the one of the testicles is involved with only 1.5% of blunt testicular injuries involving both testes [10].

Grigorian et al [5] reported in their study from USA, that penetrating trauma was the most common overall mechanism, with assault by firearm being the most common penetrating injury. Of blunt traumas, the most common was a motorcycle accident. They added that the majority of patients had isolated scrotal or testicular trauma.

Previous studies have found blunt mechanism is the most common mechanism leading to genitourinary trauma. They occurring in up to 85% of cases of scrotal or testicular injury, whereas their study found

that only 44.6% of cases presented after a blunt mechanism, whereas 50.5% were involved in a penetrating mechanism with the majority being due to assault with a firearm [8,19].

Penetrating testicular injuries occur as a consequence of assaults with gunshots or knives, war injuries, especially bomb blasts; straddle type falls on sharp objects or in rare cases animal bites. They are in most of the cases associated with perineal, pelvic, or abdominal injuries [20].

The mechanism of injury in blunt trauma involves a blow forcing the testicle against the thigh or pubis with subsequent intra-parenchymal bleeding. The rupture of the tunica albuginea, which is the capsule in which the testicular parenchyma is situated, follows when the applied force exceeds 50 kg according to previous studies [21].

If the bleeding remains within the tunica vaginalis, (another membranous structure surrounding the testicles) we speak about the formation of a haematocele. Breaking of the tunica vaginalis because of high intratesticular pressure and bleeding in scrotum forms a haematoma and an obvious enlargement of the affected testicle. Except blood there is also extravasation of testicular parenchyma in the scrotum. Penetrating testicular injuries have a different mechanism as already mentioned and tetanus vaccination is mandatory with both active and passive immunization. Antibiotics should also be given for different periods of time depending on situation because of the risk of wound infection [22,23].

We illustrated the causes of the testicular trauma in our study as follows: vehicle accident (25.6%), gunshot wounds (20.9%), pedestrian collision (18.6%), sport trauma (15.1%), work site (10.5%), and motor collision (9.3%).

Similar to our findings were reported by Mitchell et al [19] they found in their study that motor vehicle collision/motor cycle crash (MVC/MCC) accounted for 26.1%. They added, that in their findings they found MCC/MVA and sports injuries were the

most common culprits of blunt testicular trauma, each causing 26.1% of the total blunt injuries.

Where testicular rupture is concerned, when surgery is done within the first 72 hours of symptom onset salvage rates are up to 90%, which decreases to approximately 45% when intervention is delayed over 72 hours [13].

In our current study, most of unilateral orchiectomy men (73.3%) patients succeeded to conceive and 26.7% were not succeeded, ($p > 0.05$).

Kukadia et al [24] reviewed 15 patients 23 to 59 years old who underwent immediate exploration after testicular trauma between 1972 and 1991 in USA. Of the patients, 11 were contacted and 8 returned for prospective follow up. Of the 8 patients 1 (13%) achieved and 7 (87%) did not attempt conception.

In our current study, the period of conceive after orchiectomy summarized in Table 2 and Figure 3. After 1 year (27.9%) occurred conceive then after 2 years (23.2%) occurred conceive and after 3 years (22.2%). there was relation between values ($p < 0.05$).

Zhang et al [25] reported in their study, that the pregnancy rate was higher and time to pregnancy shorter in patients who had undergone preservation of the injured testicle, compared with patients who had undergone orchiectomy following onset of torsion at a similar age. When torsion occurred in adolescence, the time to pregnancy was significantly longer in the orchiectomy group than in the repositioning/orchiopexy group. Significant differences in pregnancy rates were also observed between orchiectomy and orchiopexy patients in all three age groups.

CONCLUSION

Testicular injuries are seldom between the injuries of the genitourinary tract because of the protection offered to them by their anatomical position between the thighs and because of their mobility.

In our study, the total study patients who underwent orchiectomy were 86. We found blunt trauma was predominant. The causes of the testicular trauma in our study were vehicle accident, gunshot wounds, pedestrian collision, sport trauma, and motor collision. We found the most of unilateral orchiectomy men succeeded to conceive. Further studies are in need.

Declaration by Authors

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