Testicular and scrotal changes induced by percutaneous testis biopsy in rats

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Percutaneous testis biopsy with true-cut biopsy needle is offered as an alternative to open biopsy. Percutaneous testicular biopsy was performed in 10 adult male rats bilaterally. Another 10 rats were undergone standard open testicular biopsy for comparison to the percutaneous testis biopsy materials. Biopsy specimen as well as testicular and scrotal changes were evaluated on 20th postoperative day. In true-cut biopsy group It was observed that testicular tissue protruded from the tunica albugínea in 11 testes. Epididymal injury was noted in two testes. Complications such as infection and intra or extratesticular hematoma did not occur. Histopathological examination revealed a diminished number of tubular sections compared to open biopsy specimen and loss of histological details in 15 testes. Biopsy material was insufficient in 5 testicular biopsies. Due to high percentage of inadequate tissue, and epididymal injuries, we conclude that open biopsy is still the gold standart. [Turk J Med Res 1995, 13(3): 83-85]

Key Words: Testis, Scrotum, Biopsy

Testicular biopsy has remained an integral part of the evaluation of male fertility problems. The technique, which requires a surgical incision into the testicular tissue with subsequent closure, has tradionally been performed in hospital operating room by using general or local anesthesia. In most cases the patient would be rendered to several days of restricted activity.

Several recent reports have discussed the relative merits of percutaneous needle biopsy compared with open surgical testicular biopsy. The proponents of needle biopsy suggested that this technique can be performed as an office procedure with little pain and low morbidity and can yield adequate information in selected patients (1-4).

However, needle biopsy techniques involve the limitation of providing relatively few tubular cross sections for examination, with the resultant of loss of some histologic information as compared to a standard open surgical biopsy specimen (5).

Our study on rats with regard to the value of needle biopsy and complications is presented.

Received: Dec. 1,1994 **Accepted:** April 4,1995

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MATERIALS AND METHODS

Bilateral percutaneous testicular biopsy was performed in 10 adult male Sprague-Dawley rats (average weight 300 gr). Scrotum was cleaned with povidone-iodine solution after general anesthesia by ether inhalation and anesthesia extended by ketamine hydro-cloride (50 mg/kg). Testicles were pulled in to the scrotum by gentle palpation of the abdomen and testis was grasped with thumb and forefinger and epididymes were localized posterior position. Percutaneous testicular biopsies were performed by using a 16 gauge True-Cut biopsy needle. Each testis biopsied only once, avoiding to make multiple punctures on the tunica albuginea and testicular tissue. Another 10 rats were undergone standard open testicular biopsy for comparison to the percutaneous testis biopsy materials.

Technique: The biopsy needle is held firmly closed with the obturator fully retracted to cover the specimen notch and is inserted just into the tunica albuginea, which will offer firm resistance until punctured. First, the cutting canula is slowly advanced into the testicular tissue, next, while the obturator advanced, the canula retracted at same time the tissue is cut, thus avoiding further penetration into the testis than necessary. The needle is immediately withdrawn and the testis released, and direct pressure is applied to the puncture site for 5 minutes.

The specimen is immediately transferred to the container with the Bouin's solution, with the tissue removed from the needle as delicately as possible. Any gauze or rough instruments do not contact with the specimen. The procedure is repeated on contralateral testis.

At the end of 20th day, scrotomy was performed with scrotal midline incision. Scrotal contents were exposed and excised with testes, epididymis and tunica vaginalis. Photographs were taken and the testes with epididymis and tunica vaginalis were fixed in Bouin's solution and sent for histological evaluation by using standard preparation techniques.

RESULTS

It was observed that testicular tissue protruted from the tunica albugínea in 11 testes. Protrution size was ranged 0.2-0.5 mm (Figure 1). Protruted tissues were attached to tunica vaginalis and surrounding tissue. In the other 9 testes, there were not any protrution but, biopsy site was covered with fibrous tissue. Epididymis was injured and spermatic granuloma existed in two testes.

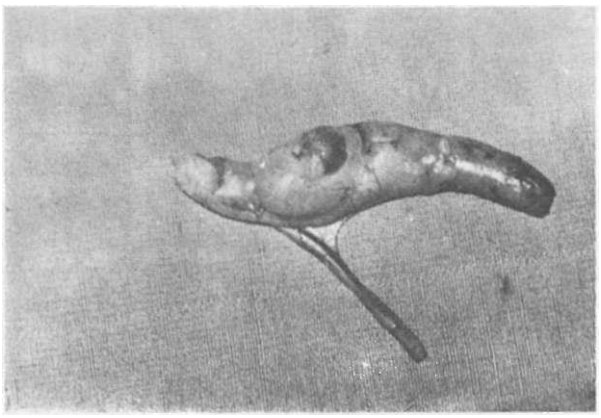

Figure 1. Testicular tissue protrution from tunica albugínea

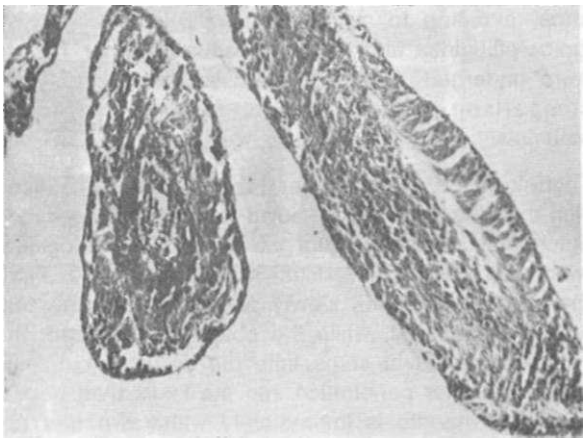

Figure 2. Section of the tru-cut biopsi material (H+E, x125)

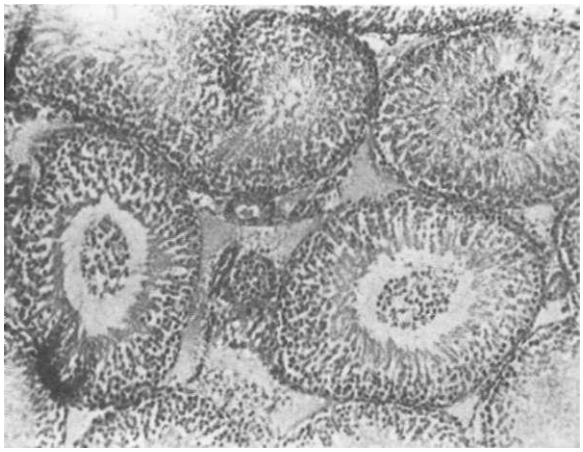

Figure 3. Section of the open testicular biopsy material (H+E, x125)

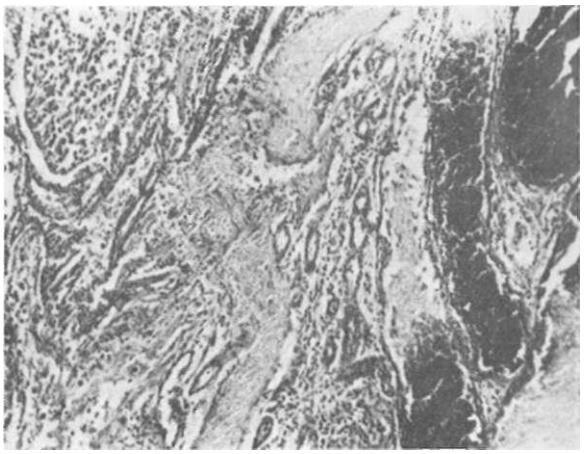

Figure 4. Spermatic granulomas and calcifications in the some tubules (H+E,x125)

Histopathological examination revealed a diminished number of tubuler sections compared to open biopsy specimen and loss of histological details especially interstitial tissue and average number of tubules was three in 15 testes (Figure 2,3). Biopsy material was insufficent for histologic examination in 5 testicular biopsies.

Sections of the testes revealed multiple small spermatic granulomas on the testicular tissue and calcifications in some tubules (Figure 4).

Complications such as infection, intra or extratesticular hematoma did not occur.

DISCUSSION

Cohen and Warner reported that a percutaneous needle biopsy of testis is a rapid, simple, inexpensive means for the collection of tissue which proved to be

safe and diagnostically accurate (1). Also, needle biopsy technique seems best suited for the azoospermic patient as a simple means of documenting spermatogenesis in the office setting under local anesthesia, so that subsequent operative exploration with microsurgical capability can be planned (5).

But, percutaneous biopsy of the testis carries risks. If too small a piece of testis is removed for examination, the tubules will tend to fall apart and artifactual changes will make the specimens difficult to interpret. This has been a common problem in attempting to interpret biopsy specimens obtained percutaneously with true-cut type devices. Most investigators have often found that these specimens contain only three to six tubules with poorly preserved architecture (5-7). Our biopsy specimens, too, were observed to contain an average of three tubules per section that could be interpreted histologically which was insufficient to comment on.

Also, this blind biopsy procedure could result in unintentional injury to either the epldidymal or testicular artery coursing on the surface of the tunica albugínea (7). Also, we saw two epididymal injuries with spermatic granulomas.

Complications related to open testicular biopsy are infrequent, the most common being bleeding from the scrotal wall (8). This is because that open biopsy is done under direct vision by incising tunica albugínea. Another reason for this low rate of complications is that the tissue excised from the region next to the tunica albugínea and deeper region of the testicular tissue is not damaged. Suturing the tunica albugínea prevents the protrution of testicular tissue as well as results in less adhesion. The tissue that Is penetrated by the biopsy needle is limited to the tract of the needle itself; however it is deeper than the open biopsy technique. This results in multiple tubular destruction and related spermatic granulomas and calcifications as seen in our cases.

Further studies comparing needle biopsies with concurrent standard surgical biopsies are needed to determine the accuracy of needle biopsy techniques in quantifying spermatogenesis. But, we may say that, open testicular biopsy is more reliable and it reflects the histologic picture more detailed.

Ratlarda perkutan testis biopsisinin testiste ve skrotumda oluşturduğu değişiklikler

True-cut biopsi iğnesi ile yapılan perkutan testis biopsisi açık biopsiye bir alternatif olarak görüldü. 10 erişkin erkek ratda bilateral olarak perkutan testis biopsileri yapıldı. Diğer 10 rata ise standart açık biopsi yapılarak kontrol grubu olarak true-cut biopsi gurubu ile karşılaştırıldı. Operasyondan sonraki 20. günde spesimeni ile beraber testis ve scrotumdaki değişiklikler değerlendirildi. 11 testiste testis dokusunun tunica albugineadan protrude olduğu gözlendi. 2 testiste epididimal yaralanma kaydedildi. İnfeksiyon, intra ve extratestiküler kanama gibi komplikasyonlara rastlanmadı. Histopatoiojide açık biopsiyle kıyaslandığında azalmış sayıda tubulus kesiti ve 15'inde histolojik detaylarda kayıp gözlendi. 5 testis biopsisinde ise biopsi materyeli yetersizdi. Gerek materyelin önemli bir grupta yetersizliği gerek epididimal yaralanmalar nedeni ile perkutan biyopsinin açık biyopsi kadar emin ve yol gösterici olduğunu düşünmüyoruz. [Türk J Med Res 1995, 13(3): 83-85]

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