



## Childhood testicular tumors

### Çocukluk çağı testis tümörleri

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#### Abstract

**Introduction:** Testicular tumors are rare in childhood. In this study, it was aimed to evaluate our patients with testicular tumor.

**Methods:** Twenty patients had been evaluated between 2006-2016 in terms of age, presenting symptoms, side, presence of metastasis, surgical intervention, histopathological evaluation results, preoperative AFP and  $\beta$ hcg levels.

**Results:** Twenty patients were between 0.4 and 17.5 years old (median 8.8 years). Preoperative AFP values were high in 9 (45%) patients (5 teratom and 4 endodermal sinus tumor) and  $\beta$ HCG values were high in 4 (20%) patients (3 teratom and 1 endodermal sinus tumor). At diagnosis, 5 patients had metastasis (2 lungs and 3 retroperitoneal lymph nodes). 8 (40%) patients underwent orchiectomy after frozen biopsy, 9 (45%) patients underwent orchiectomy, 1 (5%) patient underwent testis sparing surgery after frozen biopsy. Histopathological examination revealed that there was germ cell tumor in 13 (65%) patients including endodermal sinus tumor in 5 (25%) patients, mixed germ cell tumor in 4 (20%) patients, teratoma in 3 (15%) patients, seminoma in 1 patient, neoplastic infiltration in 4 (20%) patients, paratesticular rhabdomyosarcoma in 2 (10%) patients and malignant mesenchymal tumor in 1 (5%) patient. 14 (70%) patients received chemotherapy and 2 (10.5%) patients received radiotherapy. Metastases developed in 3 (15.7%) of the patients. Two (10.5%) patients with neoplastic infiltration were ex-itus.

**Discussion and Conclusion:** In childhood testicular malignancies, testis sparing surgery should be tried in appropriate patients. Frozen biopsy is helpful in determining surgical method.

**Keywords:** Childhood testicular tumors; frozen biopsy; testis sparing surgery.

#### Özet

**Amaç:** Testis tümörleri çocukluk çağında nadir görülmektedir. Bu çalışmada kliniğimizde testis tümörü nedeni ile ameliyat edilen olguların değerlendirilmesi amaçlandı.

**Gereç ve Yöntem:** 2006-2016 tarihleri arasında testiste kitle nedeniyle ameliyat edilen 20 hasta yaş, başvuru bulguları, taraf, metastaz varlığı, uygulanan cerrahi, histopatolojik değerlendirme sonuçları, ameliyat öncesi AFP ve  $\beta$ HCG düzeyleri açısından geriye dönük olarak incelendi.

**Bulgular:** Yaşları 0.4-17.5 yıl arasında (ortalama 8.8 yıl) olan 20 hasta çalışmaya alındı. Tamamı ağrısız skrotal şişlikle başvurdu. Ameliyat öncesi 9 (%45) hastanın (5 teratom ve 4 endodermal sinüs tümörü) AFP ve 4 (%20) hastanın (3 teratom ve 1 endodermal sinüs tümörü)  $\beta$ HCG değeri yüksekti. Hastaların 5'inde tanı esnasında metastaz vardı (2 akciğer ve 3 retroperitoneal lenf nodu). Hastaların 8'ine (%40) frozen biyopsi sonrası orşiektomi, 9'una (%45) orşiektomi, 1'ine (%5) frozen biyopsi sonrası testis koruyucu cerrahi, neoplastik infiltrasyon olan 2 (%10) hastaya ise doku tanısı için sadece testis biyopsisi uygulandı. Histopatolojik incelemede 13 (%65) hastada germ hücreli tümör bulundu. Bunlar; 4 (%20) endodermal sinüs tümörü, 5 (%25) mikst germ hücreli tümör, 3 (%15) teratom, 1 (%5) seminom'du. 4 (%20) hastada neoplastik infiltrasyon, 2 (%10) hastada paratestiküler rhabdomyosarkom, 1 (%5) hastada ise malignant mezenchimal tümör görüldü. Hastaların 15'i (%75) kemoterapi, 2'si (%10.5) radyoterapi aldı. Hastalardan 5'inde (%25) metastaz görüldü. Takiplerinde neoplastik infiltrasyonu olan 2 (%10.5) hasta exitus oldu.

**Sonuç:** Çocukluk çağı testis malignitelerinde uygun hastalarda testis koruyucu cerrahi denenmelidir. Frozen biyopsi cerrahi yöntemin belirlenmesinde yardımcıdır.

**Anahtar Sözcükler:** Çocukluk çağı testis tümörleri; frozen biyopsi; testis koruyucu cerrahi.

Testicular tumors are rare in childhood, therefore, lack of consensus on the management of these tumors.<sup>[1]</sup> The bimodal distribution is characteristic of testicular tumors within young adults and first 3 years old. The most common histo-

logic features are yolk sac and teratom in childhood tumor in contrast to adult testicular tumors including seminoma or mixed germ cells.<sup>[2]</sup> Orchiectomy is gold standart treatment for testicular tumors in children.<sup>[3]</sup> But, in children, most testic-



ular tumors are benign and therefore recently testis-sparing surgery has become alternative option.<sup>[4]</sup>

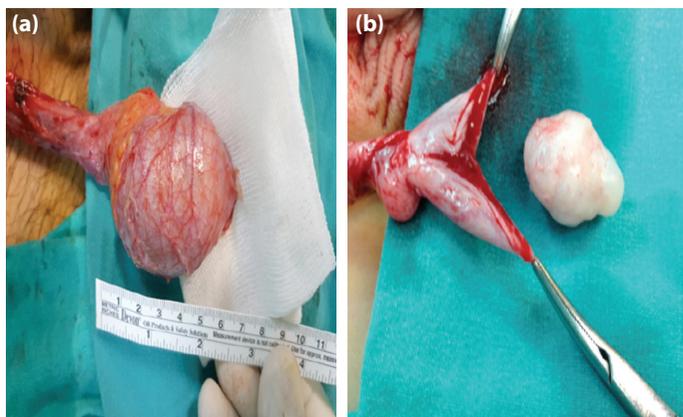
In our study, we aim to evaluate children with testicular tumors at last 10 years in our hospital.

## Materials and Method

20 patients who underwent surgery due to testicular mass between 2006- 2016 were retrospectively evaluated in terms of age, presenting symptoms, side, presence of metastasis, surgical intervention, histopathological evaluation results, preoperative AFP and  $\beta$ HCG levels.

## Results

Twenty patients aged between 0.4 and 17.5 years (median 8.8 years) were included in the study. All of the patients had painless scrotal swelling. In 11 (55%) patients, the mass was in the left testis. Preoperative AFP values were high in 9 (45%) patients (5 teratom and 4 endodermal sinus tumor) and  $\beta$ HCG values were high in 4 (20%) patients (3 teratom and 1 endodermal sinus tumor). Those patients with high  $\beta$ HCG values also had high AFP values. At diagnosis, 5 patients had metastasis (2 lungs and 3 retroperitoneal lymph nodes) 8 (40%) patients underwent orchiectomy after frozen biopsy, 9 (45%) patients underwent orchiectomy, 1 (5%) patient underwent testis sparing surgery after frozen biopsy (Fig. 1a and b), and 2 (10%) patients with neoplastic infiltration were applied testicular biopsy only for tissue analysis. Histopathological examination revealed that there was germ cell tumor in 13 (65%) patients including endodermal sinus tumor in 5 (25%) patients, mixed germ cell tumor in 4 (20%) patients, teratoma in 3 (15%) patients, seminoma in 1 patient), neoplastic infiltration in 4 (20%) patients, paratesticular rhabdomyosarcoma in 2 (10%) patients and malign mesenchymal tumor in 1 (5%) patient. 14 (70%) patients received chemotherapy and 2 (10.5%) patients received radiotherapy. Metastases developed in 3 (15.7%) of the patients. Two (10.5%) patients with neoplastic infiltration were exitus.



**Figure 1.** Enucleation of testicular tumor.

## Discussion

Testicular tumors (TT) in children are a different entity from adults testicular tumors.<sup>[5,6]</sup> TT have two peaks in age including less than 3 years of age and after puberty.<sup>[7,8]</sup> Benign testicular tumors occur more commonly than malignant tumors in children.<sup>[6]</sup> But clinically differential diagnosis between benign and malignant testicular mass is not easy. Both of them present as painless scrotal mass.<sup>[9]</sup> AFP and b-HCG as a tumor marker may help, for distinguish and decide to testicular sparing surgery or orchiectomy. bHCG raise in choriocarcinoma and embryonal carcinoma.<sup>[10]</sup> AFP increase in yolk sac tumor and teratoma and in benign teratoma, AFP does not increase as high as malignant tumors.<sup>[11,12]</sup>

On testicular ultrasound, cystic lesions such as dermoids, well circumscribed borders may tend to be benign tumors. Computed tomography can detect malignant tumor metastases in the retroperitoneal lymph nodes and lung.<sup>[13,14]</sup> For testicular sparing surgery, the most reliable method is intraoperative frozen biopsy. In our series nine frozen biopsy were performed and we spare one testis with enucleation of well-encapsulated lesion (teratom). We suggest that clinically suspected benign lesion, Testicular biopsy provide to spare of testis intraoperatively.

The surgical procedure in childhood testicular malignancies is orchiectomy. Testis-sparing surgery has become alternative option in appropriate patients. In these patients, preoperative ultrasound findings (cystic, well capsulated etc), existence of metastases, intraoperative appearance of lesion and frozen biopsy result lead us about the type of surgery.

In conclusion, for childhood testicular tumors, the frozen biopsy will be main diagnostic method with preoperative radiologic findings to determine whether testis sparing surgery or radical orchiectomy.

**Conflict of interest:** There are no relevant conflicts of interest to disclose.

## Kaynaklar

1. Arbay OC, Koloğlu MB, Şenocak ME, Tanyel FC, Büyükpamukçu M, Büyükpamukçu N. Testicular tumors in children. *J of Pediatr Surg* 2006;36:1796–801.
2. Ross JH. Prepubertal testicular tumors. *J Urol* 2009;74:94–9.
3. Taskinen S, Fagerholm R, Aronniemi J, Rintala R, Taskinen M. Testicular tumors in children and adolescents. *J of Pediatr Urol* 2008;4:134–7.
4. Shukla AR, Woodard C, Carr MC, Huff DS, Canning DA, Zderic SA. Experience with testis sparing surgery for testicular teratoma. *J Urol* 2004;171:161–3.
5. Friend J, Barker A, Khosa J, Samnakay N. Benign scrotal masses in children-some new lessons learned. *J of Pediatr Surg* 2016;51:1737–42.
6. Alane S, Shukla AR, Metcalf PD. Pediatric testicular cancer: an updated review of incidence and conditional survival from the

- surveillance, epidemiology and end results database. *Br J Urol Int* 2009;104:1280–3.
7. Woo LL, Ross JH. The role of testis sparing surgery in children and adolescents with testicular tumors. *Urol Oncol: Semin and Organ Invest* 2016;34:76–83.
  8. Schneider DT, Calaminus G, Koch S, Teske C, Schmidt P, Haas RJ. Epidemiological analysis of 1442 children and adolescents registered in the German germ cell tumor protocols. *Pediatr Blood Cancer* 2004;42:169–75.
  9. Treiyer A, Blanc G, Stark E, Haben B, Treiyer E, Steffens J. Prepubertal testicular tumors: frequently overlooked. *J of Pediatr Urol* 2007;3:480–3.
  10. Agarwal P, Palmer J. Testicular and paratesticular neoplasms in pre-pubertal males. *J Urol* 2006;176:875–81.
  11. Wu JT, Book L, Sudar K. Serum alfa-fetoprotein (AFP) levels in normal infants. *Pediatr Res* 1981;15:50–4.
  12. Chen YS, Kuo JY, Chin TW, Wei CF, Chen KK, Lin AT, et al. Prepubertal testicular germ cell tumors: 25-year experience in Taipei Veterans General Hospital. *J Chin Med Assoc* 2008;71:357–61.
  13. Tallen G, Hernaiz DP, Degenhardt P, Henze G, Riebel T. High reliability of scrotal ultrasonography in the management of childhood primary testicular neoplasms. *Klin Pediatr* 2011;223:131–7.
  14. Bozzini G, Picozzi S, Gadda F, Colombo R, Decobelli O, Palou J, et al. Long-term follow-up testicle sparing surgery for Leydig cell tumor. *Clin Genitourin Cancer* 2013;11:321–4.