

## Polyorchidism: case report comparing ultrasonography and magnetic resonance imaging

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### Abstract

*Introduction: polyorchidism is an unusual pathology, about 200 cases in the world literature.*

*Case report: we reported a case of polyorchidism in a 16-year-old male patient diagnosed by ultrasound and confirmed by magnetic resonance imaging.*

*Discussion: most of the cases presented, there is a supernumerary testis, but there are reports on more than three, up to five testicles with supranumerical gonads on both sides of the scrotum. The diagnosis is usually performed in late puberty, incidentally, with a painless scrotal mass or at the emergency room, presenting a testicular torsion of the whole hemiscrotum or supernumerary testis alone, and the differential diagnosis should be made with epididymal cyst and spermatocele, besides other extra-testicular masses (hydroceles, varicoceles, lipomas, tumors.) and para-testicular masses (hernias, scrotal calculi). After the initial clinical evaluation, ultrasound is the first line subsidiary exam. Magnetic Resonance Imaging is very helpful, just in case the ultrasound diagnosis is uncertain. The supernumerary testis have the same Magnetic Resonance Imaging characteristics as the normal testes (intermediate signal intensity on T1-weighted images and high signal intensity on T2-weighted images).*

**Key words** Testicle, Ultrasonography, Magnetic resonance imaging, Polyorchidism



## Introduction

Polyorchidism is an unusual pathology, about 200 cases in the world literature.<sup>1</sup> Most of the cases presented, there was a supernumerary testis, but there are reports on more than three, up to five testicles, with supernumerary gonads on both sides of the scrotum.<sup>2,3</sup>

The extra-testis are usually intra-scrotal (up to 75% of the cases), but there are many reports on them presenting as maldescended testis, mimicking an inguinal hernia or even intra-abdominal (up to 5% of the reports).<sup>1,4</sup> The left side is most commonly affected with only as much as 25% of the reports, compromising the right side.<sup>4</sup>

Physiopathology for this condition is still poorly understood. Currently, the genital crest is conceivable to suffer a duplication, most probably due to incomplete mesonephrondegeneration, which predisposes to the development of peritoneal bands; these bands cause genital crest division.<sup>2</sup>

Our aim is to report a case of polyorchidism in a 16-year-old male patient diagnosed by ultrasound and confirmed by magnetic resonance imaging.

## Case Report

A 16-year-old male patient complaining of a painless swelling of the scrotum. The physical examination revealed a fibroelastic and mobile nodule in the scrotum transition and in the proximal portion of the penis; the rest of the physical examination was normal. The patient denied any history of trauma or previous surgeries. He referred to continuous subcutaneous use of somatotropin 4.0 UI for short stature, having to interrupt the use of parenteral testosterone eight months ago (which he had been using for nine months). His height was 163 cm and weighed 36.5 kg, Tanner G3P4 staging. The main laboratory findings are described in Table 1.

An ultrasound (US) was performed and detected one structure compatible with a testicle in the right side of the base of the penis and two on the left side (Figure 1). The findings were confirmed by magnetic

resonance imaging (MRI) (Figure 2); The MRI did not find any extra testicles in the abdomen. The patient was, then, referred for a supernumerary testis removal surgery, after discussing the case with the urology service department, due to its location and risk of malignancy.

## Discussion

Supernumerary testis diagnosis is usually performed in late puberty, incidentally, with a painless scrotal mass or at the emergency room, presenting a testicular torsion of the whole hemiscrotum or the supernumerary testis alone,<sup>1,2</sup> and the differential diagnosis should be made with epididymal cyst and spermatocele, besides other extra-testicular masses (hydroceles, varicoceles, lipomas, tumors) and para-testicular masses (hernias, scrotal calculi).<sup>5</sup>

After the initial clinical evaluation, ultrasound is the first line subsidiary exam identifying a scrotal mass with features identical to normal testis which can be attached or separated to the ipsilateral gonad, located inferiorly or superiorly;<sup>5</sup> contrast enhanced ultrasound (CEUS) could be used to help exclude the presence of neoplasia.<sup>6</sup>

In the Doppler ultrasound, the supernumerary testis demonstrate similar echo texture and vascular flow as a normal tests.<sup>5</sup> The MRI is very helpful in case the ultrasound diagnosis is uncertain.<sup>5</sup> The supernumerary testis have the same Magnetic Resonance Imaging characteristics as the normal testes (intermediate signal intensity on T1-weighted images and high signal intensity on T2-weighted images).<sup>5</sup>

Besides the mechanical complications, malignancy can also arise from a supernumerary testis; undescended testis is a classical risk factor for testicular germ cell tumors, but polyorchidism also may be associated.<sup>7</sup> The association of supernumerary testis and seminoma has about one hundred cases reported in the current literature, but more recent histological reports show over 30% incidence of cell abnormalities and up to 7% of polyorchidism cases which may be associated with malignancy.<sup>7</sup> The

**Table 1**

Laboratorial test results.

Results	Reference
TSH: 0.96 µIU/mL	0.5-4.5 mIU/mL
Free T4 : 1.01 ng/dL	0.80-1.20 ng/dL
(IGF-1) Somatomedin C: 257 ng/mL	150-384 ng/mL
Total Testosterone: 312 ng/dL	200-950 ng/dL

histological patterns of malignancy reported are seminomas, choriocarcinomas, teratomas, and embryonal carcinoma.<sup>2</sup> The location of the supernumerary gonad plays an important role in malignancy risk, as extra-scrotal poses a higher risk.<sup>8</sup>

The management of polyorchidism is still a matter of debate; the classical approach is to remove the supernumerary testis regardless of its location.<sup>9</sup> Along the years, with the evolution of ultrasound and magnetic resonance imaging, more conservative management, with clinical observation, became more acceptable; there are now reports of up to 6 years of observation if no acute complications occur.<sup>8</sup>

One important factor to keep in mind when dealing with a supernumerary testis is the attachment of it to a vas deferens, since it may infer a normal functioning testis, as, undrained testis cannot

contribute to fertility.<sup>2</sup>

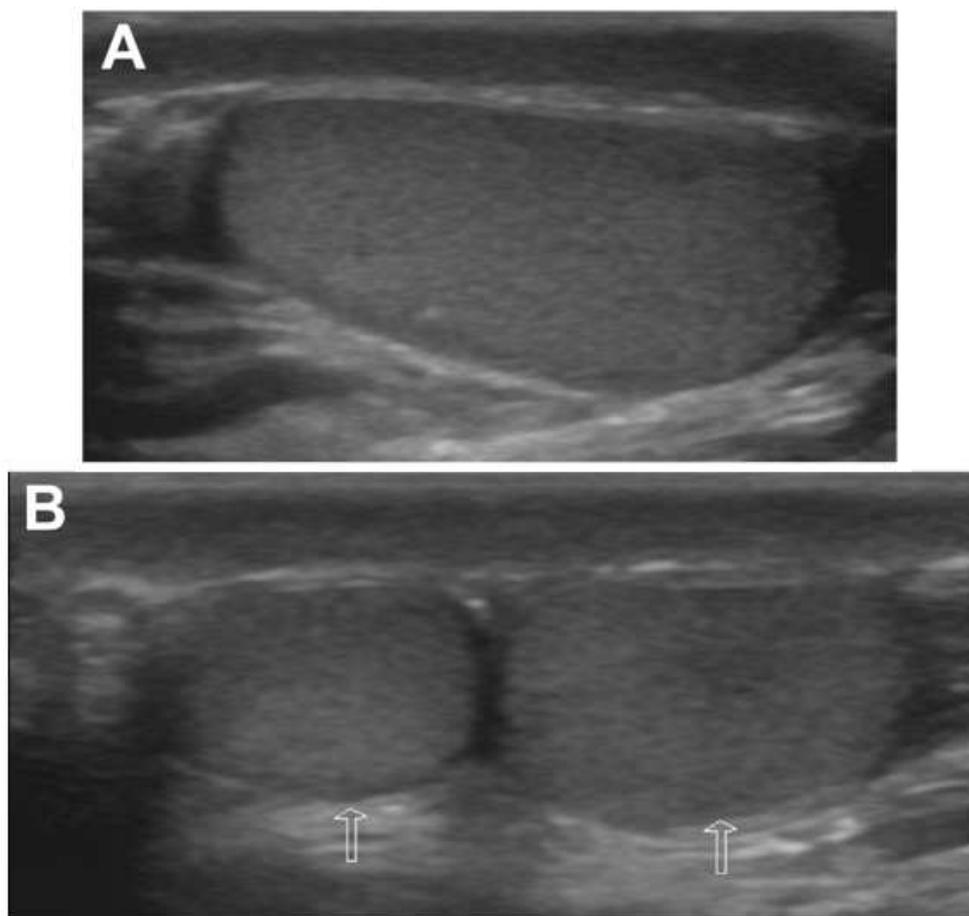
Bergholz and Wenke<sup>2</sup> suggested that cases detected on an out-patient scenario should undergo biopsy with intraoperative frozen section and proceed with orchiectomy if signs of malignancy are apparent, or orchiopexy if malignancy is ruled out. It is important to notice that this malformation usually preserves spermatogenesis and endocrine function.<sup>10</sup>

### Authors' contribution

Santos LR: interpretation of data and manuscript draft. Duarte ML: data acquisition. Duarte ER: data acquisition and interpretation. Figueiras FN: manuscript draft, critical revision. All authors approved the final version of the article.

**Figure 1**

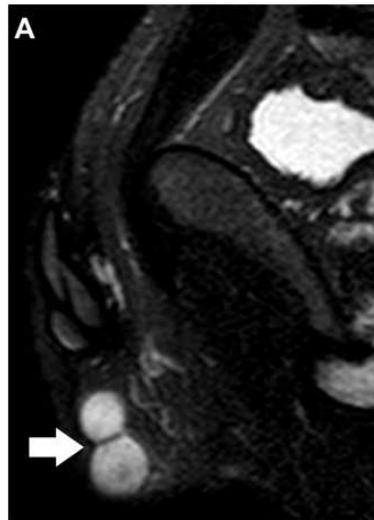
Ultrasonography of polyorchidism.



In A, ultrasound demonstrating one right testicle in the base of the penis. In B, ultrasound demonstrating two left testicles in the base of the penis (arrows).

Figure 2

Magnetic resonance image of polyorchidism.



MRI in T1-weighted image in sagittal section in A and in coronal section in B, demonstrating two left testicles (white arrows) and one right testicle (grey arrow).

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