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Blind ending vessels on diagnostic laparoscopy for nonpalpable testis: Is a nubbin present?

Renea Sturm [a], Eric Kurzrock [b], Gregory Amend [b], Rachel Shannon [a], Edward Gong [a], Earl Cheng [a]

[a]Division of Urology, Ann and Robert H. Lurie Children's Hospital, Chicago, IL, USA

[b]Department of Urology, University of California Davis, Sacramento, CA, USA

Correspondence to: R. Sturm, Ann & Robert H. Lurie Children's Hospital, Division of Urology, 225 E. Chicago Avenue, Box 24, Chicago, IL 60611, USA

rsturm@luriechildrens.org (R. Sturm)

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Summary

Introduction
The traditional management paradigm for nonpalpable testis (NPT) has been that inguinal or scrotal exploration for a nubbin may be omitted when blind ending vessels are observed during diagnostic laparoscopy. Our aim was to examine whether blind ending vessels excluded the presence of a nubbin in a series of boys who underwent exploration in this setting.

Materials and methods
Using a surgical database and chart review, prepubertal boys (≤12 years) with the diagnosis of undescended or atrophic testis who underwent a diagnostic laparoscopy for unilateral NPT between 2000 and 2015 were retrospectively identified. Physical exam, procedural and pathologic findings were confirmed by chart review.

Results
595 boys underwent diagnostic laparoscopy for NPT by 11 surgeons. Of these, 318 had an intra-abdominal testis and 18 underwent diagnostic laparoscopy alone. Of the remaining 259, 32 had an open internal ring and inguinal or scrotal exploration was performed. The remaining 227 with a closed ring comprised the cohort for our analysis, of whom 188 had vessels entering the ring, 36 had blind ending vessels, and in three the vessel status was unavailable. In the 188 boys with vessels entering the ring, 164 (87%) had a nubbin excised during inguinal or scrotal exploration, of which 93% were grossly identified as an atrophic testis. Pathology confirmed the presence of hemosiderin in 44% and calcifications in 54%. In the 36 boys with blind ending vessels, 26 (72%) had a nubbin excised during inguinal or scrotal exploration, of which 96% were grossly identified as an atrophic testis. Pathology confirmed hemosiderin in 54% and calcifications in 58%. All seven cases with both blind ending vas and vessels had an atrophic testis grossly identified. Of all 207 excised remnants in this series, nubbins with viable testicular elements (seminiferous tubules in 11, germ cells in two) were only excised during cases that reported a non-atretic vas or any vessels entering the internal ring.

Conclusion
In this large multi-institutional series, blind ending vessels were associated with a nubbin noted during inguinal or scrotal exploration in the majority of cases. Based on this series if the surgeon's goal is to remove all nubbins, exploration is necessary regardless of vessel appearance. However, viable testicular elements were rarely identified and only when either a non-atretic vas or any vessels were observed to enter the ring.

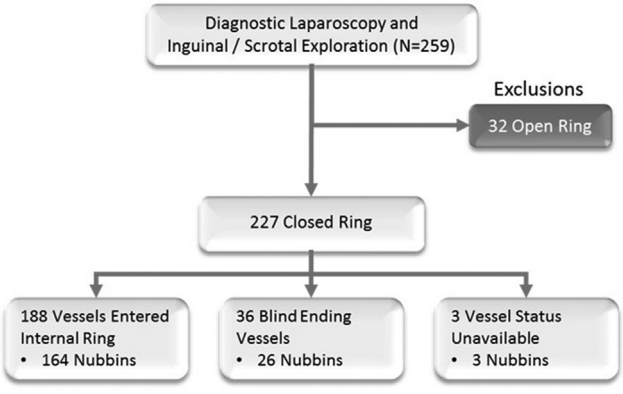

Figure Study cohort.

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Introduction

In boys with nonpalpable testis, traditional management involves inguinal or scrotal exploration for a testicular remnant (nubbin) when vessels are observed to enter a closed internal ring during diagnostic laparoscopy. When blind ending vessels are present, the procedure may be halted without further exploration. This management paradigm is supported by both the current American Urological Association (AUA) [1] and the European Association of Urology/European Society for Pediatric Urology Guidelines [2]. However, controversy exists regarding both the etiology of bind ending vessels and the indications for inguinal or scrotal exploration following diagnostic laparoscopy [1,3,4].

Recent experience at our institutions and prior published series have indicated that a nubbin may be identified during inguinal or scrotal exploration following diagnostic laparoscopy regardless of vessel status [3,5,6]. Our aim was to examine whether the observation of blind ending vessels excluded the presence of a nubbin. We hypothesized that a nubbin was often present on inguinal or scrotal exploration regardless of laparoscopic findings.

Methods

Using a surgical database and the electronic medical record, we retrospectively identified pre-pubertal boys ($\leq$12 years) with the diagnosis of undescended testis (ICD9 752.51) or atrophic testis (608.3) who underwent a diagnostic laparoscopy between 2000 and 2015 by a pediatric urologist. Charts were reviewed to verify the finding of a unilateral NPT on intraoperative examination. Exclusion criteria included a diagnosed or ongoing workup for a disorder of sexual development or previous inguinal or scrotal surgery.

Data extraction included review of clinical visit documentation, operative notes, and pathology reports. Operative notes were reviewed for the description of the ring, vas and vessels, surgical approach, gross description of structures identified and procedure performed including completion of a contralateral orchiopexy. The internal ring was noted as open (included any reported as partially open) versus closed. Vas and vessels were defined as blind ending if described by the surgeon as ending in an intra-abdominal location without entry into the ring during diagnostic laparoscopy (Fig. 1A). If the vas or vessels entered the ring, they were categorized as either normal or atretic in comparison with the contralateral side (Fig. 1B). Each structure identified during inguinal or scrotal exploration was categorized as a viable appearing testis, atrophic testis within tunica vaginalis, no evidence of testis but epididymis visualized, cord structures present without a distal structure or other finding. For the purposes of this analysis, structures grossly identified by the surgeon as either an atrophic testis or epididymis alone were categorized as nubbins.

All pathology reports of excised specimens were reviewed. All specimens were evaluated by hematoxylin and eosin (H&E) examination with completion of additional immunohistochemical stains per institutional protocols.

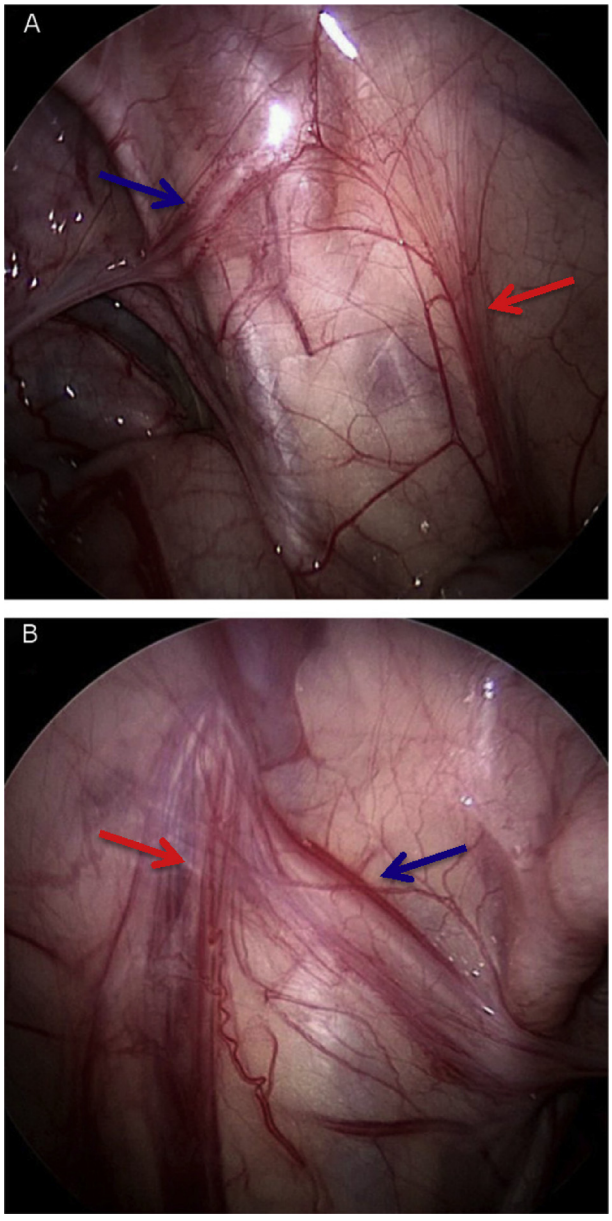

Figure 1 Intraoperative images obtained during diagnostic laparoscopy performed in an 8-month-old boy with a unilateral nonpalpable testis in whom a scrotal nubbin was excised. (A) Side of NPT/nubbin (right) with blind ending vessels and vas, closed ring. (B) Contralateral side (left) with palpable descended testis; vas and vessels entering a normal/closed internal ring. Blue arrows represent vas; red arrows represent vessels (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.).

The presence of hemosiderin (included annotations of "remote hemorrhage," "hemosiderin laden macrophages," or "pigment deposition"), calcifications, germ cells (GCs), and seminiferous tubules (STs) were recorded. Slides were not reevaluated for this retrospective study. However, a pathologist with expertise in pediatric genitourinary pathology was consulted to review reports as needed for clarification and consistency.