



Research Article

Epidermal Inclusion Cyst of the Median Raphe of the Penis: A Case Report

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Abstract

Median raphe cysts represent infrequent benign lesions that develop due to abnormalities during embryonic formation of the urethral folds. Epidermal inclusion cysts arising along this anatomical line are particularly rare and can be mistaken for other penile swellings. They often appear as small, firm white or yellow swelling causing discomfort or tenderness. It can be congenital or acquired by epithelial cell implantation into the skin. It frequently occurs in young men often appearing in the second to third decade, although they are present from childhood. We describe a case involving a 24 months-old male who presented with a painless cystic lesion along the median raphe of the penis since birth. The swelling was managed by complete surgical removal, and histological evaluation confirmed the diagnosis of an epidermal inclusion cyst. Recognition of this condition is important to ensure correct diagnosis and appropriate treatment.

Keywords

Epidermal Inclusion Cyst, Median Raphe Cyst, Penile Lesion, Congenital Anomaly

1. Introduction

The median raphe extends along the ventral surface of the penis from the urethral opening to the perineum and corresponds to the line formed during fusion of the urethral folds in embryonic life [1, 4]. Lesions arising along this tract, referred to as median raphe cysts, are uncommon and encompass different histological types such as urethral cyst, epidermal inclusion cyst, and dermoid cysts [4, 7].

Among these, epidermal inclusion cysts are rarely encountered [2, 3]. Although usually asymptomatic, it may lead to cosmetic concerns or patient anxiety due to their location. Awareness of such lesions helps clinicians differentiate them

from other penile pathologies and avoid unnecessary interventions. While distinguishing benign cyst may have limited clinical significance, since local incision is the preferred definitive treatment in most cases, improved recognition is important to avoid confusion in premalignant conditions [12, 13].

2. Case Presentation

A 24-months-old male reported in surgical outpatient department with a painless swelling about 1.5 cm in diameter

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over the ventral aspect of the penis. The swelling had been present since birth, but was noticed recently by his parents due to slight increase in its size. The lesion had shown gradual enlargement over time but was not associated with pain, discharge, urinary complaints or any features of inflammation. There was no relevant history of trauma, infection, or prior procedures. On the basis of above clinical findings a provisional diagnosis of median raphe cysts of penis was made with differential diagnosis of urethral cyst, dermoid cyst and epidermal inclusion cyst.

2.1. Clinical Examination

1 examination revealed a single, well-demarcated, dome-shaped swelling measuring about 1.5×1 cm, located along the median raphe of the penile shaft. The lesion was soft, non-tender and mobile, with normal overlying skin, not adherent to skin. No regional lymph node enlargement was observed (Figure 1).



Figure 1. Clinical image showing a localized cystic swelling along the median raphe on the ventral penile shaft.

2.2. Provisional Diagnosis

Based on these findings, a provisional diagnosis of a median raphe cyst was considered. The lesion was completely excised under local anesthesia.

2.3. Intraoperative

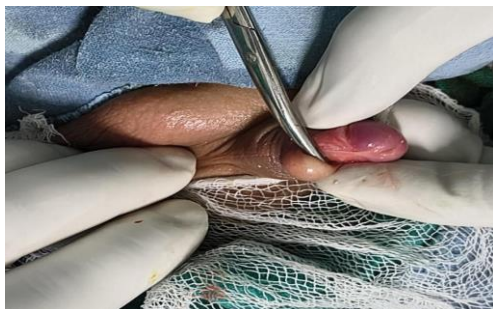


Figure 2. Intraoperative view demonstrating removal of a well-defined cystic structure.

During surgery, the cyst was found to be encapsulated and separate from the urethra (Figure 2).

3. Histopathology

3.1. Gross

On gross examination - an oval grey white soft tissue mass measuring 1.5×1 cm. Outer surface was smooth (Figure 3).



Figure 3. Excised specimen measuring approximately 1.5×1 cm with smooth outer surface.

Cut section

On cut section - a thickened walled cystic space seen, filled with dirty color amorphous necrotic material.

3.2. Microscopic

On microscopic examination - cyst wall is thickened with fibro collagenous stroma. Underlying surface is lined by stratified squamous epithelium with a distinct granular layer. Cyst is filled with keratin debris and flecks (Figure 4).

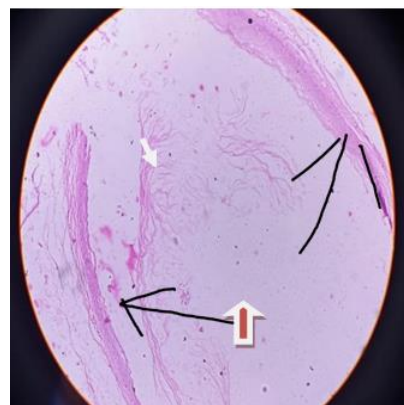


Figure 4. Histological section (H&E stain) showing squamous epithelial lining with keratin-filled lumen. Features of epidermal inclusion cyst' = Red arrow- cystic space. BLACK arrow- Lining squamous epithelium. White arrow - Keratin fleck.

It is consistent with an epidermal cyst [2, 5] (Figure 4).

There were no features suggestive of malignancy [12].

Recovery was uneventful. At follow-up after six months, no recurrence was detected, and the parents were satisfied with the outcome and longer follow-up is planned.

4. Discussion

Median raphe cysts are thought to originate from developmental disturbances during formation of the male urethra, possibly due to incomplete fusion or entrapment of epithelial elements [1, 7]. These cysts may appear anywhere along the midline extending from the glans penis to the perineal region [4]. Basically it is of two types, urethroid and epidermoid. Based on whether the epithelium is of urethra or epidermal tissue. The epidermal subtype is relatively rare and is often identified in adolescents or young adults [3, 5]. Typically, such lesions are slow-growing and symptom-free but may occasionally become noticeable due to enlargement or cosmetic concerns.

Conditions that may resemble median raphe cysts include dermoid cysts, epidermoid cyst of glans penis and mucous cyst of penis [14, 15]. Steatocystoma, urethral diverticula, vascular tumors [9] such as glomus tumors, and infective lesions. These cysts can also arise as a complication of penile girth enhancement surgery. [10] Careful clinical assessment usually provides sufficient guidance; however, imaging techniques like ultrasonography may be considered when deeper extension or urethral involvement is suspected.

Definitive identification relies on histopathological evaluation [2]. Though immunohistochemistry is highly useful for urothelial origin of Median raphe cyst. [8] Epidermal cysts are characterized by a keratin-filled cavity lined with stratified squamous epithelium lacking adnexal structures [5]. As there were no skin adnexa, especially pilosebaceous structures within the cyst wall and hair follicles, dermoid cyst is ruled out.

Steatocystoma simplex of the penis is also ruled out, as there was no eosinophilic inner lining of cyst wall with empty lumen having no recognizable cyst content.

Surgical removal of the lesion in total is regarded as definitive management and generally results in excellent outcomes [2, 6]. Recurrence is uncommon when excision is complete [6]. There is no documented evidence suggesting malignant change in such lesions. Malignant transformation is extremely rare but has been reported in isolated cases [12, 13].

5. Conclusion

Epidermal cysts occurring along the median raphe of the penis are rare and benign [2, 3]. Sometimes a huge penile mass is benign and noncancerous if it turns out to be an epidermal inclusion cyst. [11]. They rarely turn into malignancy. They should be considered when evaluating cystic lesions of the penile shaft. Confirmation through histopathology and management by complete excision leads to favorable cosmetic and clinical results with a very low likelihood of recurrence [6].

1. The present case highlights a classical clinical presentation with clear surgical and histopathological correlation, which adds to the limited pool of documented cases and reinforces awareness among clinicians. The epidermal variant is particularly rare.
2. Histopathological analysis is essential for confirmation.
3. Surgical excision offers definitive treatment with minimal recurrence. Median raphe cysts are uncommon developmental lesions of the genital midline.

Author Contributions

Nilay Kumar: Conceptualization, Writing – original draft

Aninda Mandal: Project administration, Writing – review & editing

Sandip Kumar Singh: Formal Analysis, Investigation

Saurabh Vijayrao Khadatkar: Methodology

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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