



Organ-sparing partial glansectomy: an alternative surgical management for invasive penile carcinoma – case report

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Background: Penile cancer is a rare malignancy treated via various surgical techniques guided by disease stage and grade with current guidelines suggesting partial or total penectomy for those with pT2 or greater. We report a case of a patient with pT2 squamous cell carcinoma (SCC) of the penis who underwent circumcision with left partial-glansectomy and *en bloc* resection of preputial mass with good oncological control while providing good urinary and sexual function.

Case Description: An 82-year-old male presented to the clinic due to a mass that doubled in size in an 8-month timeframe. Treatment options were discussed with the patient including the risks and benefits of each electing wide-excision in glans-sparing fashion, possible partial penectomy. Given the possibility of low-grade verrucous carcinoma upon intraoperative exploration, ultimately, circumcision with left partial-glansectomy and *en bloc* resection of preputial mass was performed guided with intraoperative negative frozen sections. Patient's surgery and post-operative course were uncomplicated, followed with serial exams, and cross-sectional images showing no recurrence or metastasis.

Conclusions: Careful case selection with close postoperative follow-up monitoring for local recurrences, such as in this case, can allow patients to elect for organ-sparing partial glansectomy—when complete resection is feasible—as an acceptable option for oncological control in patients with pT2 penile cancer while providing good urinary and sexual function.

Keywords: Penile cancer; glans tumor; organ-sparing; squamous cell carcinoma (SCC); case report

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Introduction

Penile cancer is a rare cancer which accounts for fewer than 1% of cancers in men in the United States (1). The stage and grade of the disease determine the surgical technique would best benefit the patient. The National Comprehensive Cancer Network (NCCN) guidelines indicates that a glansectomy is reserved for patients with a T_a or T_{is} as well as select cases of low-grade T₁ staging. Penile cancers with a pT₂ or greater (tumor invades into

corpus spongiosum (either glans or ventral shaft) or corpora cavernosum (including tunica albuginea) with or without urethral invasion are recommended to undergo partial or total penectomy (2). Herein, we report the surgical and oncologic outcomes of a patient with pT₂ penile cancer who underwent circumcision with left partial-glansectomy and *en bloc* resection of preputial mass. We present this case in accordance with the CARE reporting checklist (available at <https://tau.amegroups.com/article/view/10.21037/tau-24-512/rc>).

Case presentation

An 82-year-old male presented to the Eleanor N. Dana Cancer Center clinic at the University of Toledo due to a penile mass, originally the size of a pecan, which doubled in size in eight months. He denied penile pain, itching, or discharge from the mass, gross hematuria, dysuria, or irritative lower urinary tract symptoms. He reported a monogamous relationship with his wife for 55 years and denied any history of human papillomavirus (HPV) or genital warts or tobacco use. He had not been sexually active for the last five years. He had a medical history of hypertension, hyperlipidemia, remote skin cancer, and benign prostatic hyperplasia. Physical examination revealed an uncircumcised penis with a 3 cm × 2 cm firm, solid mass at the left aspect of prepuce and glans penis not involving urethral meatus. Penis had severe phimosis with unretractable foreskin with no shaft lesions (*Figure 1*). There was no palpable inguinal lymphadenopathy.

Magnetic resonance imaging (MRI) penile mass protocol revealed 2.9 cm × 2.0 cm solid mass along the left lateral margin of the glans, not convincingly involving distal tunica albuginea of corpora or spongiosum. No enlarged pelvic or inguinal lymphadenopathy was appreciated. Prostatomegaly with bladder trabeculation diverticula was noted (*Figure 2*).

Diagnosis and treatment

Treatment options were discussed including risks and benefits of wide-excision in glans-sparing fashion,



Figure 1 Physical examination revealed an uncircumcised penis with severe phimosis and unretractable foreskin. A 3 cm × 2 cm firm, solid mass palpable at the left aspect of prepuce and glans penis (red arrow) not involving urethral meatus or penile shaft.

glansectomy, and partial penectomy. The patient elected for wide-excision in glans-sparing fashion, possible partial penectomy if unable to obtain negative surgical margins with organ-sparing surgery.

Intraoperatively, a verruciform mass was noted invading both the left aspect of glans penis and prepuce. Given the possibility of verrucous carcinoma, which is often a low-grade squamous cell carcinoma (SCC), therefore, circumcision with left partial-glansectomy and *en bloc* resection of preputial mass was performed guided with intraoperative negative frozen sections (*Figure 3*).

Postoperative follow-up

The patient had smooth recovery from the surgery with excellent cosmesis (*Figure 3G, 3H*). Pathology revealed SCC, grade 2 moderately differentiated, 3.5 cm in size, unifocal involving left glans penis and foreskin, invading corpus spongiosum, lymphovascular invasion present, all surgical margins negative, pathologic stage pT2pNx (*Figure 4A, 4B*).

Postoperative staging computed tomography (CT) chest, abdomen, and pelvis with IV contrast were all negative for metastatic disease indicating American Joint Committee on Cancer (AJCC) stage IIA (pT2, cN0, cM0). We discussed

Highlight box

Key findings

- Organ-sparing partial glansectomy is an acceptable option for oncological control in patients with pT2 penile cancer and provides good urinary and sexual function.

What is known and what is new?

- Penile cancer is a rare malignancy with treatment guided by disease stage and grade with current guidelines suggesting partial or total penectomy for those with pT2 or greater.
- Partial glansectomy for pT2 penile cancer is feasible only when complete resection with negative surgical margin is achieved.

What is the implication, and what should change now?

- Careful patient selection and shared decision making with close postoperative follow up can provide trifecta outcome: oncological control, maintain urinary and sexual function in patients with pT2 penile cancer.

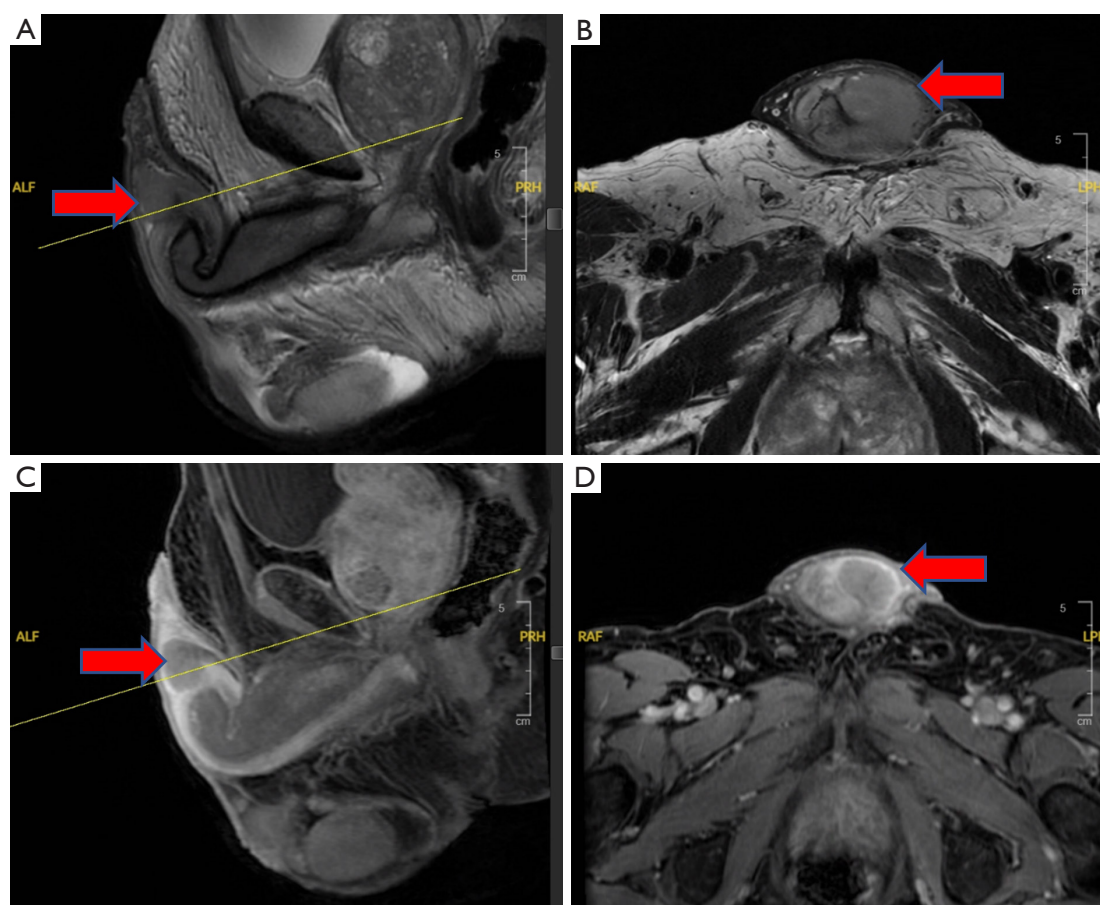


Figure 2 Preoperative MRI penile mass protocol including (A) sagittal T2 and (B) axial T2, and with IV contrast [(C) sagittal and (D) axial] revealed 2.9 cm × 2.0 cm solid mass along the left lateral margin of the glans, not convincingly involving distal tunica albuginea of corpora or spongiosum. No evidence of inguinal or pelvic lymphadenopathy. MRI, magnetic resonance imaging.

the risk of micro-metastasis in up to 25% of patients to inguinal lymph node despite radiographically negative cross-sectional imaging for enlarged lymph nodes. Given the patient's high risk, it was recommended proceeding with either bilateral inguinal lymph node dissection (ILND) or bilateral dynamic sentinel node biopsy (DSNB). Patient declined subsequent ILND, DSNB, and even declined prophylactic radiation to inguinal nodes. He had great satisfaction with excellent oncologic, functional, and cosmetic outcomes (*Figure 5*). He was agreeable for surveillance with cross-sectional imaging. At 12-month post-operative follow-up visit, physical examination, MRI pelvis and CT chest revealed no recurrent or residual tumor, no abnormal lymphadenopathy, and no evidence of metastatic disease (*Figure 6*). Overall, patient reported that he had great satisfaction with excellent oncologic,

functional, and cosmetic outcomes.

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

Discussion

The management of penile cancer is heavily guided by staging and grading of the cancer. The staging and grading for penile cancer follow AJCC TNM clinical and pathological classification. The NCCN guidelines suggest a partial or total penectomy or radiation or chemoradiation

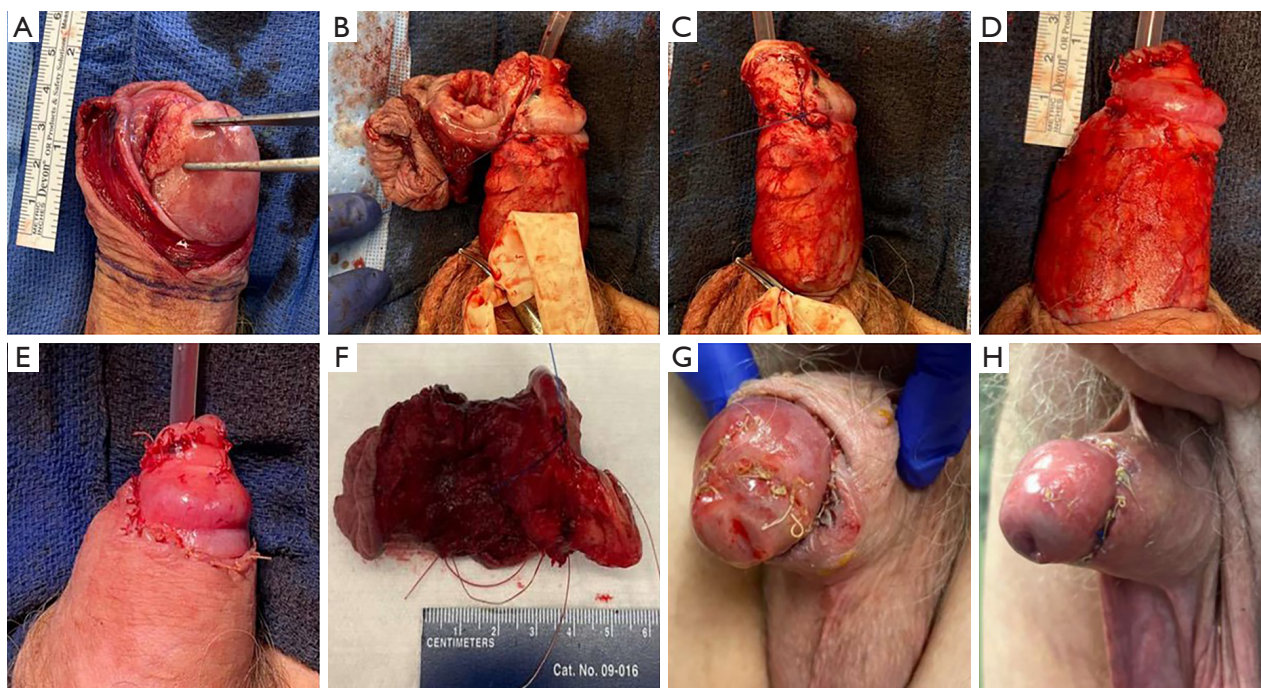


Figure 3 Invasive penile cancer treated with circumcision, left partial-glansectomy, and *en bloc* resection of preputial mass. Intraoperative (A-E) illustrating preputial tumor with involvement of left glans penis following dorsal slit and subsequent *en bloc* resection. Specimen (F), and postoperative [(G) day #4 and (H) day #30; respectively] photographs show excellent healing.

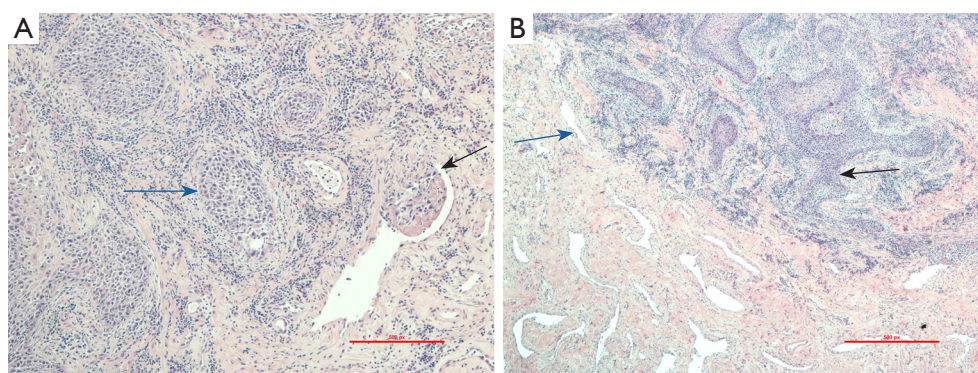


Figure 4 Invasive squamous cell carcinoma of left glans penis and foreskin (moderately differentiated). (A) H&E section with 10× magnification. Blue arrow: nests of malignant squamous cells with moderate differentiation showing hyperchromasia, irregular nuclear membranes, and focal keratinization with dyskeratotic cells. Black arrow: focus of lymph-vascular invasion. (B) H&E section with 4× magnification. Blue arrow: corpus spongiosum layer, characterized by numerous vascular spaces with thick muscular walls. Black arrow: nests of squamous cell carcinoma extending into the corpus spongiosum layer, indicating pT2 invasion. H&E, Hematoxylin & Eosin.

for the management of pT2 SCC. Alternatively, for glans and coronal lesions, the European Association of Urology guidelines, which for our patient's case would suggest wide local excision, partial or total glansectomy with

reconstruction, or radiotherapy (3).

Regardless of which guideline is used, the primary target is to ensure that the treatment has a high recurrence-free survival rate while maintaining patient's urinary, sexual

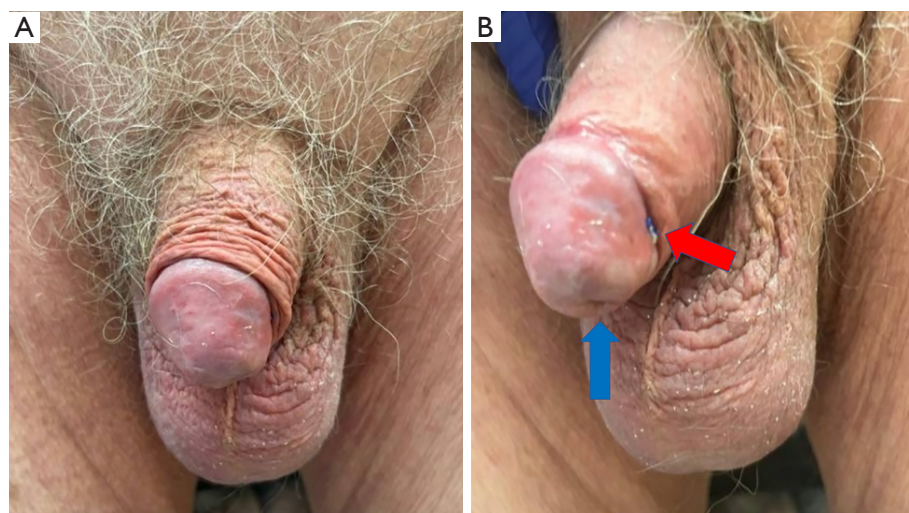


Figure 5 Phallus photographs 4 months postoperatively show excellent cosmesis with patent urethral meatus (blue arrow) and residual polydioxanone suture (red arrow) removed.

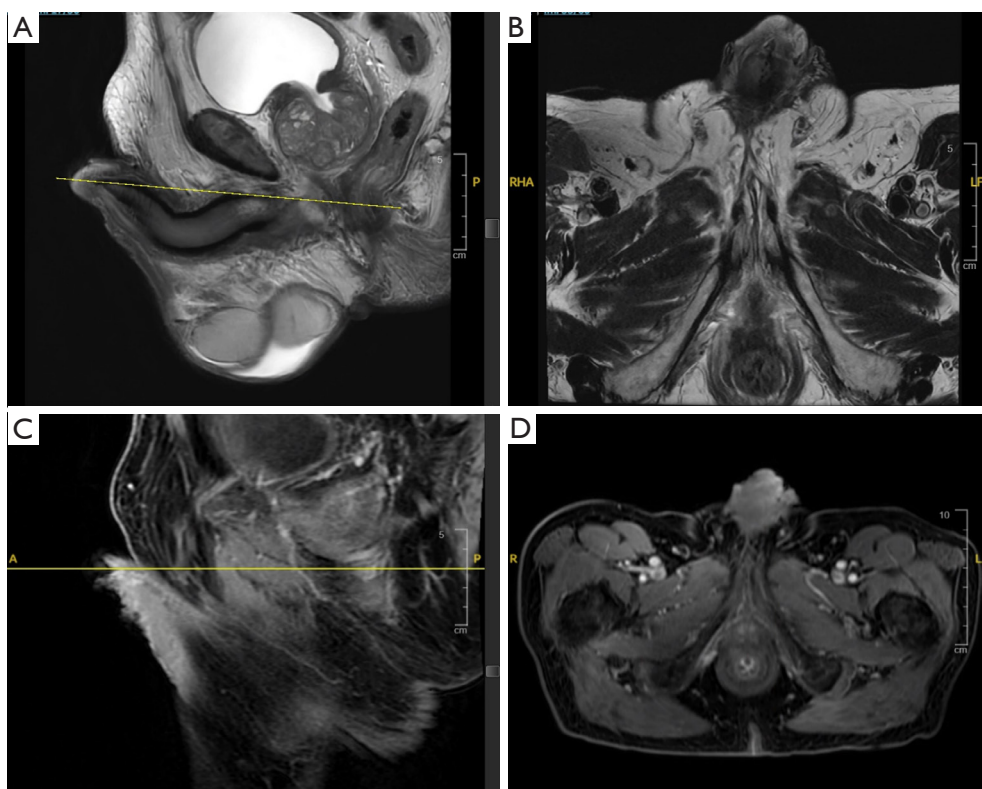


Figure 6 One-year postoperative MRI penile mass protocol including (A) sagittal T2 and (B) axial T2, and with IV contrast [(C) sagittal and (D) axial] confirmed no evidence of residual, recurrent disease or abnormal inguinal or pelvic lymphadenopathy. MRI, magnetic resonance imaging.

function and quality of life (QoL) as much as possible. The strength of this study falls into two-fold: (I) Careful case selection and surgeon expertise. Careful case selection for wide local resection determined by history, physical exam, duration of symptoms, size and location of tumor relative to urethral meatus, urethra, corpus spongiosum and corpus cavernosum, guided with preoperative cross sectional MRI imaging of pelvis allowed to choose wide local resection with negative surgical margins as a treatment option based on preoperative counseling to determine patient's goals and expectations. (II) Surgical principles determined by: (i) The expertise of the surgeon is essential to maintain surgical oncologic principles of complete resection of all carcinomas without residual disease. (ii) Ability to adjust surgical approach based on the intraoperative findings. In this case during the resection glans penis component of the mass appeared to be adherent to corpus spongiosum. The novelty of our case is not only based on careful wide and complete resection without violating the integrity of the mass or injuring the underlying urethra, or adjacent urethra meatus but also is derived from the ability to primarily reconstruct the glans penis using rotational flap to perform glansplasty. (iii) The generous use of intraoperative frozen section to inform margin status supplemented by an experienced pathologist gave further support for the chosen surgical treatment. However, like with many case reports, its limitation is the generalizability of the results. Although the patient had good outcomes, this is a single event and therefore, recurrence-free survival and overall survival for all patients can't be determined just on this case report.

There are several risk factors associated with development of penile cancer including chronic inflammation such as balanitis, penile trauma, lack of neonatal circumcision, tobacco use, lichen sclerosus, poor hygiene, and a history of sexually transmitted disease(s), especially human immunodeficiency virus (HIV) and HPV. The main risk factors in our case are not only his age or lack of neonatal circumcision but also the presence of phimosis. Patients with phimosis carry an increased risk for penile cancer of 25% to 60% (4).

Compliance with follow-up is a very important factor in choosing the less aggressive treatment, as it statistically is known to have a higher chance of local recurrence compared to partial or total penectomy. According to NCCN guidelines, if a patient underwent topical or local

therapy, then clinical examination is every three months for post-operative years 1–2, every six months for post-operative years 3–5, and yearly for post-operative years 5–10. Alternatively, partial or total penectomy requires clinical examination every 6 months for post-operative years 1–2 and yearly for post-operative years 3–10 (4). In the study by Parnham *et al.* involving 172 patients, there was a 9.3% local recurrence rate with a median follow up period of 41.4 months (5). Other studies have had similar findings following glansectomy and skin grafting with a successful surgical outcome able to preserve good urinary and sexual function (6–8). A shared decision making between the patient and the physician is the pivotal guiding point to what ultimately is performed to achieve desired oncological and functional outcomes.

Beyond the scope of urinary and sexual function, there is a psychological comorbidity that occurs with partial or total penectomy. Veeratterapillay *et al.* has shown that organ-preserving surgery, such as glansectomy, can help decrease the psychosocial comorbidity that is often found with partial or total penectomy (9). In another study patients who underwent wide local excision appeared to have better sexual function at one-year post-surgery compared to those patients who had glansectomy when assessed by International Index of Erectile Function in its short 5-item form (20.1 *vs.* 17.0, $P=0.02$) and Sexual Function Questionnaire (48.6 *vs.* 40.3, $P<0.001$) (10). Further research can be done on patients' psychosocial outcome before and after organ-sparing versus partial or total penectomy as this is a domain less studied than local recurrence and genitourinary function.

Conclusions

Organ-sparing partial glansectomy improves the psychosocial comorbidity that comes along with partial or total penectomy while providing good urinary and sexual function. Careful case selection with close postoperative follow-up surveillance for local recurrence can provide acceptable oncological control in patients with pT2 penile cancer.

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Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist. Available at <https://tau.amegroups.com/article/view/10.21037/tau-24-512/rc>

Peer Review File: Available at <https://tau.amegroups.com/article/view/10.21037/tau-24-512/prf>

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://tau.amegroups.com/article/view/10.21037/tau-24-512/coif>). The authors have no conflict of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

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