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Pituitary Abscess with Preserved Pituitary Hormone Profile and Co-existing Pituitary Adenoma: A Case Report

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Case Report

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Abstract

Background:

Pituitary abscess is a rare and potentially life-threatening sellar pathology, accounting for less than 1% of pituitary lesions. It frequently mimics a pituitary adenoma on imaging, and diagnosis is often made intraoperatively. Preserved pituitary hormonal function is uncommon and further complicates preoperative diagnosis, particularly when associated with an underlying sellar lesion.

Case Presentation:

A 39-year-old male presented with a four-month history of progressive bifrontal headache and retro-orbital pain, followed by one week of bilateral visual blurring. He was afebrile with no signs of systemic infection or meningism. Neurological and ophthalmological examinations were unremarkable. Laboratory investigations, including inflammatory markers and anterior pituitary hormonal profile, were within normal limits, except for incidental primary hypothyroidism. Magnetic resonance imaging revealed a 1.5 × 1.6 × 1.6 cm rim-enhancing sellar lesion with suprasellar extension, suggestive of a cystic pituitary adenoma. The patient underwent endoscopic transsphenoidal surgery, during which thick purulent material was encountered, confirming a pituitary abscess. The lesion was evacuated, and the sellar floor was reconstructed using a nasoseptal flap. Microbiological cultures were sterile, while histopathological examination demonstrated a coexisting pituitary adenoma. The postoperative course was uneventful, with complete resolution of symptoms. At two-year follow-up, the patient remained asymptomatic with no evidence of recurrence.

Conclusion:

Pituitary abscess should be considered in the differential diagnosis of cystic sellar lesions, even in the absence of endocrine dysfunction or systemic infection. A coexisting pituitary adenoma further increases diagnostic complexity. Early transsphenoidal drainage is both diagnostic and curative, with favorable long-term outcomes.

Background

Pituitary abscess is an exceptionally rare and potentially life-threatening condition, accounting for less than 1% of all pituitary pathologies. The largest systematic review to date identified fewer than 500 cases in the global literature. [1]

The clinical presentation frequently overlaps with that of other sellar pathologies, particularly pituitary adenomas. Headache, visual disturbance, and endocrine dysfunction are common presenting features; however, classical infectious signs such as fever, leukocytosis, and meningism are absent in nearly 70% of patients, resulting in most cases being diagnosed intraoperatively rather than preoperatively. [2] Endocrine dysfunction, most commonly hypopituitarism or diabetes insipidus, is present in

approximately 84% of cases; preserved pituitary hormonal function is documented in only approximately 15%, representing a particularly challenging diagnostic subgroup that closely mimics a non-functioning pituitary adenoma. [1]

Pituitary abscesses are classified as primary, arising in a previously normal gland via haematogenous or contiguous spread, or secondary, developing within a pre-existing sellar lesion such as a pituitary adenoma, Rathke's cleft cyst, or craniopharyngioma. [3]

Management is transsphenoidal surgical drainage combined with prolonged antibiotic therapy and hormonal replacement as indicated. [4] We report a case of pituitary abscess presenting with fully preserved pituitary hormonal function and a coexisting pituitary adenoma, managed with endoscopic transsphenoidal surgery, with complete clinical, endocrine, and radiological resolution at two-year follow-up. This is one of the longest documented follow-up periods for this condition in the published literature.

Case Presentation

A 39-year-old male with no significant past medical or surgical history presented with a four-month history of progressively worsening bifrontal headache associated with retro-orbital pain and cervical muscle spasm. One week before the presentation, he developed gradually progressive bilateral blurring of vision, more noticeable during near-vision tasks. There was no history of fever, nausea, vomiting, head trauma, sinus or dental infection, or prior endocrine disorder.

On examination, the patient was alert with a Glasgow Coma Scale score of 15/15. Neurological examination, including cranial nerves, visual acuity, and visual fields, was normal. No signs of meningism were present. Cervical spine examination revealed a restricted range of motion with posterior muscle tenderness consistent with spasm.

Laboratory investigations, including complete blood count, inflammatory markers, renal function, and electrolytes, were within normal limits. Anterior pituitary hormonal profile was unremarkable, with normal serum cortisol, prolactin, follicle-stimulating hormone, and luteinizing hormone levels. Thyroid function tests showed elevated thyroid-stimulating hormone with low free triiodothyronine and thyroxine, consistent with primary hypothyroidism, considered incidental to the presenting pathology.

Ophthalmological evaluation, including fundoscopic examination, visual field testing, and optical coherence tomography, was normal.

Contrast-enhanced MRI of the brain was done, revealing a sellar heterogeneous mass (predominantly hyper-intense in all sequences) measuring 1.5x1.6x1.6 cm in Antero-posterior (AP), Transverse(T), and Craniocaudal (CC) dimensions, causing suprasellar extension, abutment of bilateral cavernous sinus with intra-cavernous part of ICA, and posterior extent up to the Optic chiasm. (Fig. 1)

1. **Coronal T1-weighted post-contrast MRI** of the brain demonstrates a well-defined sellar and suprasellar mass with a **peripheral rim-enhancing pattern**, consistent with an abscess wall. The central content appears hypointense, representing the purulent/necrotic core. The lesion shows suprasellar extension with mild compression of the adjacent structures. No significant surrounding parenchymal edema is noted. The optic chiasm appears displaced superiorly.
2. **(B) Sagittal T1-weighted post-contrast MRI** demonstrates the **sellar mass in the midline plane**, showing the characteristic ring-enhancing lesion occupying and expanding the sella turcica with suprasellar extension. The relationship of the mass to the optic chiasm superiorly and the sphenoid sinus inferiorly is well-delineated.

The patient underwent endoscopic transsphenoidal surgery via a functional endoscopic sinus surgery (FESS) approach for sphenoidotomy to decompress the sella, obtain tissue diagnosis, and relieve symptoms. The sellar floor was opened using a diamond burr, exposing the dura. On durotomy, thick caseous purulent material was encountered, confirming a pituitary abscess. Intraoperative inspection suggested a distinct abscess cavity with a capsule separate from the underlying pituitary lesion. Samples of pus were sent for microbiological analysis. Hemostasis was achieved, and the sellar defect was reconstructed using a Hadad–Bassagasteguy nasoseptal flap. Fibrin sealant (Glubran®2) was applied to reinforce closure. (Fig. 2) A Valsalva maneuver confirmed the absence of cerebrospinal fluid leak. The postoperative course was uneventful, with complete resolution of visual symptoms. The nasal pack was removed on postoperative day three, and the patient was discharged in stable condition.

Intraoperative endoscopic view during transsphenoidal surgery showing extrusion of caseous purulent material from the sellar cavity, confirming pituitary abscess. A distinct capsule was observed surrounding the abscess, separate from the underlying pituitary lesion. Surrounding mucosa showed hyperemia consistent with inflammation. The Hadad–Bassagasteguy nasoseptal flap was prepared for reconstruction.

The postoperative course was uneventful, with resolution of visual symptoms. Microbiological cultures were sterile. Histopathological examination confirmed a coexisting pituitary adenoma.

At two-year follow-up, the patient remained asymptomatic with no evidence of recurrence clinically, endocrinologically, or radiologically.

The specimen measures 1.2 × 0.9 × 0.4 cm and demonstrates calcified nodular tissue (*cream-white, center*) admixed with gelatinous hemorrhagic material (*red-brown periphery*), consistent with a calcified pituitary adenoma. Scale in centimeters. (Fig. 3)

Discussion

Pituitary abscess remains an exceptionally rare clinical entity, with fewer than 500 cases reported worldwide. In most cases, patients present with varying degrees of hypopituitarism or diabetes insipidus, which are reported in approximately 60–80% of patients. In contrast, preserved pituitary hormonal

function, as observed in the present case, is uncommon and has been reported in only a minority of patients. This atypical endocrine profile can lead to significant diagnostic confusion and may result in misdiagnosis as a non-functioning pituitary adenoma.

Radiologically, pituitary abscess often demonstrates nonspecific features on magnetic resonance imaging, including a cystic or partially cystic sellar mass with peripheral rim enhancement following contrast administration. These imaging characteristics overlap considerably with other sellar lesions such as Rathke's cleft cyst, craniopharyngioma, or cystic pituitary adenoma. Consequently, definitive diagnosis is frequently established only during surgery when purulent material is encountered within the sellar cavity. [5]

Pituitary abscesses have been reported to harbor a wide spectrum of pathogens, including Staphylococcus and Streptococcus species (most common), as well as Neisseria, Citrobacter, Escherichia coli, Brucella, Salmonella, Mycobacterium species, and fungal organisms such as Aspergillus, Candida, and Histoplasma, but no organism was isolated in the present case. Sterile cultures are frequently reported in pituitary abscesses and may be related to prior antibiotic exposure or the fastidious nature of the causative organism. [6]

The present case is particularly noteworthy because of the coexistence of pituitary adenoma with superimposed abscess formation and the preservation of pituitary endocrine function. Such presentations are rare and highlight the importance of considering pituitary abscess in the differential diagnosis of cystic sellar lesions even in the absence of systemic infection or endocrine dysfunction.

Conclusion

Pituitary abscess is a rare but critical differential diagnosis for sellar cystic lesions, even in the absence of endocrine dysfunction or systemic infection. Because it frequently mimics pituitary adenomas, a high index of clinical suspicion is paramount. Early intervention via transsphenoidal surgical drainage remains the definitive treatment, offering excellent neurological outcomes and preventing long-term morbidity.

Abbreviations

FESS: Functional endoscopic sinus surgery ICA: Internal carotid artery

Declarations

Ethics approval and consent to participate:

This study was conducted in accordance with the principles of the 1964 Declaration of Helsinki. The Institutional Review Board of Combined Military Hospital, Rawalpindi, Pakistan, waived the requirement for formal ethical approval, as this study is a single-case report.

Consent for publication:

Written informed consent for publication of this case report and accompanying images was obtained from the patient.

Competing interests:

The authors declare that they have no competing interests.

CARE Guideline Statement:

This case report has been prepared in accordance with the CARE guideline checklist to ensure complete and transparent reporting. A completed CARE checklist is provided as an additional file.

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No funding was received for this study.

Authors' contributions:

B.U. conceptualized the study, performed the surgical procedure, and supervised the manuscript. T.K. conducted the clinical assessment, collected data, and contributed to drafting the manuscript. S.J. performed the literature review and contributed to writing the discussion. S.Z. assisted in data interpretation, table preparation, and manuscript revision. S.U. critically reviewed the manuscript and provided intellectual input. All authors read and approved the final manuscript.

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Availability of data and materials:

All data relevant to this case are included within the article. Additional information is available from the corresponding author upon reasonable request.

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Figures

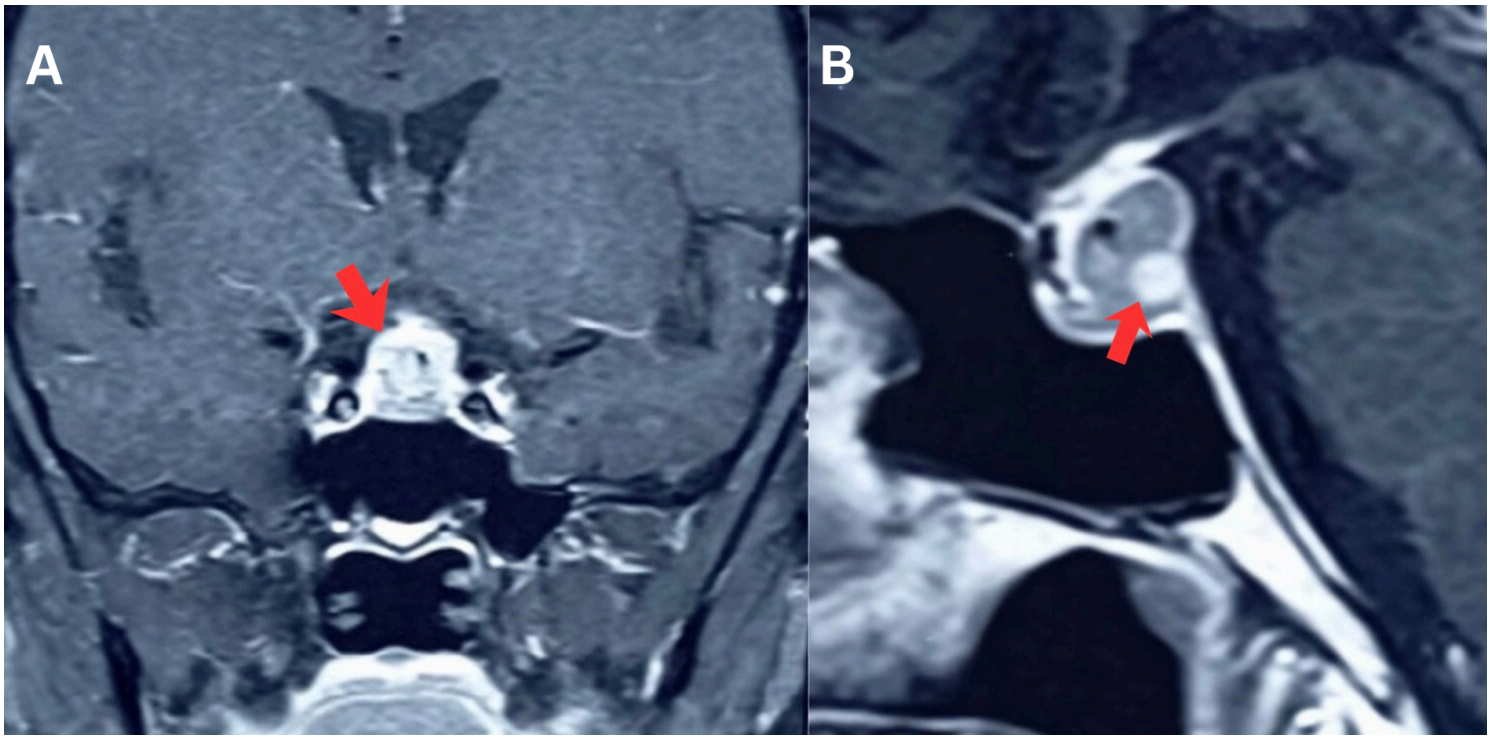


Figure 1

Contrast-enhanced MRI Brain.

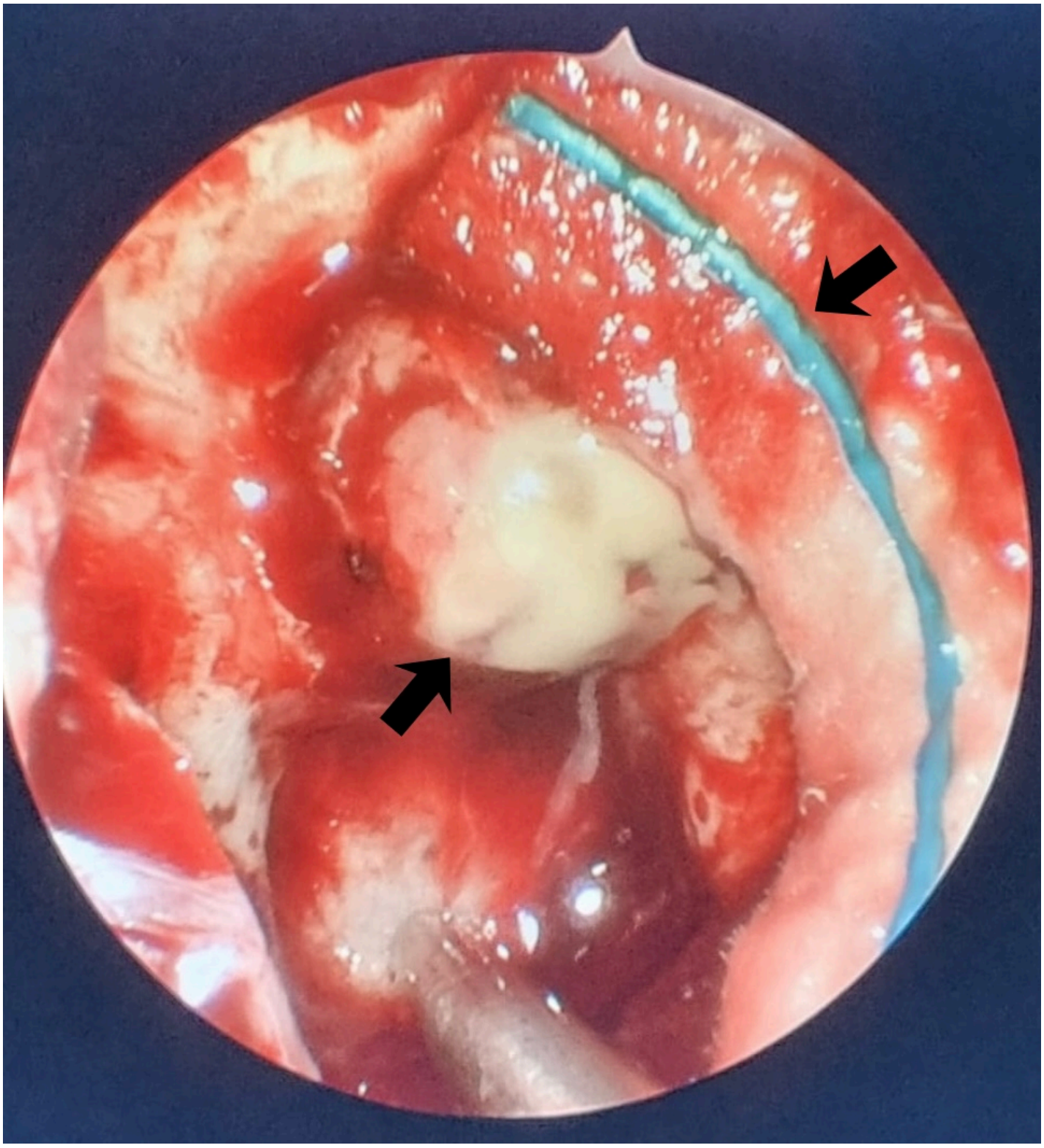


Figure 2

Intraoperative endoscopic view

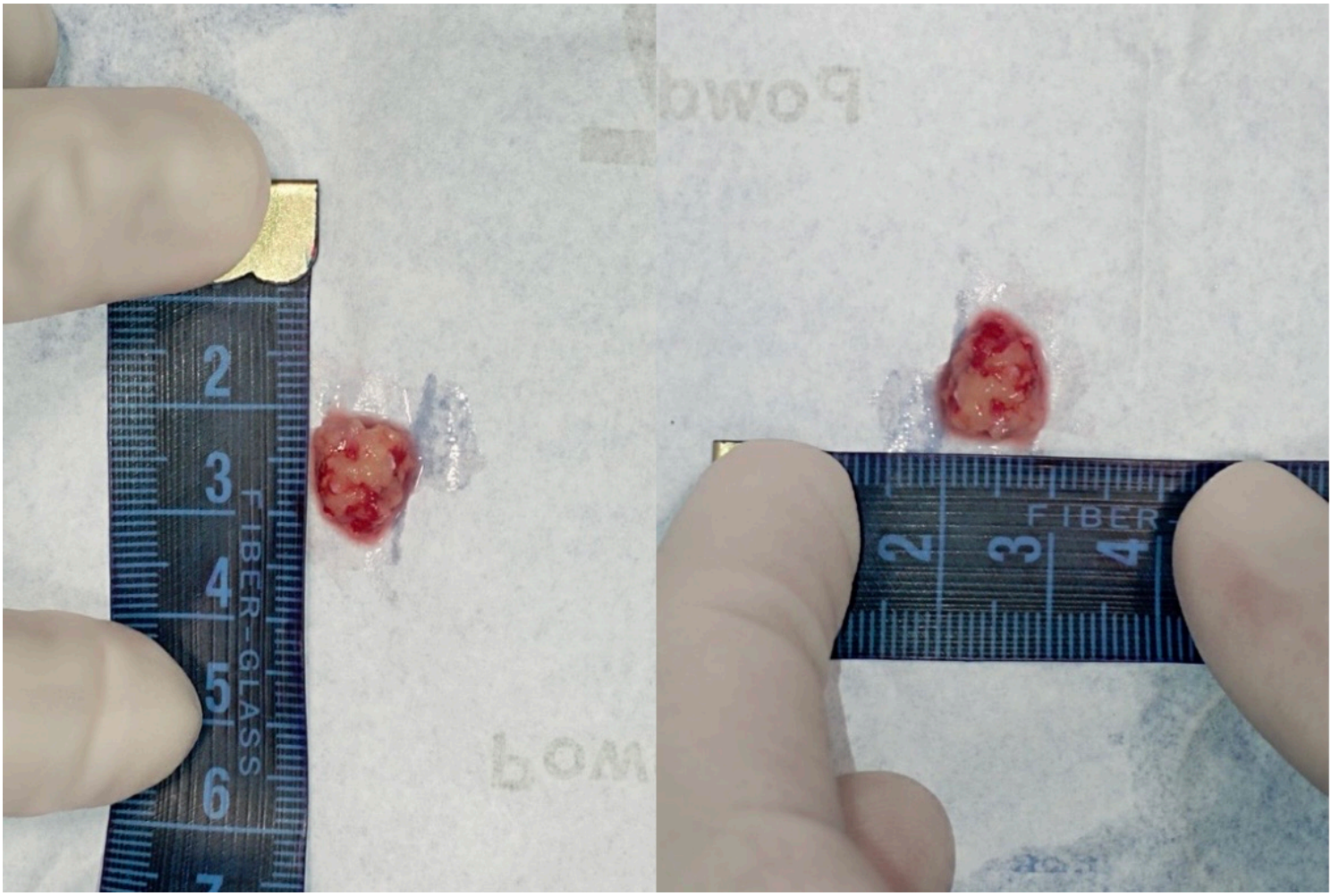


Figure 3

Gross specimen of excised pituitary lesion