ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

www.surgicalneurologyint.com

Surgical Neurology International

Editor-in-Chief: Nancy E. Epstein, MD, Professor of Clinical Neurosurgery, School of Medicine, State U. of NY at Stony Brook.

SNI: Skull Base

Editor
Mitsutoshi Nakada, MD
Kanazawa University, Ishikawa, Japan

SNI
Open Access

Case Report

Sellar colloid cyst: Peculiar radiological characteristics of a common lesion at an uncommon location

Bhanu Pratap Singh Chauhan, Binita Dholakia, Chirag Hirani, Wajid Nazir, Daljit Singh, Hukum Singh

Department of Neurosurgery, GB Pant Institute of Postgraduate Medical Education and Research, New Delhi, India.

E-mail: *Bhanu Pratap Singh Chauhan - bhanupratap1819@gmail.com; Binita Dholakia - binitadholakia@gmail.com; Chirag Hirani - chirag23hirani@gmail.com; Wajid Nazir - dr_wajidnazir@rediffmail.com; Daljit Singh - drdaljit@hotmail.com; Hukum Singh - drhsingh2008@hotmail.com

***Corresponding author:**
Bhanu Pratap Singh Chauhan, Department of Neurosurgery, GB Pant Institute of Postgraduate Medical Education and Research, New Delhi, India.

bhanupratap1819@gmail.com

Received: 07 July 2023
Accepted: 22 August 2023
Published: 15 September 2023

DOI
10.25259/SNI_571_2023

Quick Response Code:

ABSTRACT

Background: Colloid cysts, common benign lesions of the third ventricle, have rarely been reported in uncommon extraventricular locations such as the pituitary fossa. Even in the sellar region, it is usually seen between the anterior and posterior pituitary lobes (pars intermedia).

Case Description: Here, we report a case of a female patient, who was incidentally diagnosed with a sellar colloid cyst, while being evaluated for nonspecific holocranial headache. On imaging, there was a lesion located in the anterior sellar region, compressing the whole pituitary gland posteriorly (first reported case to the best of our knowledge), that was found to be a colloid cyst intraoperatively during microsurgical excision through transnasal transsphenoidal route.

Conclusion: This rare entity should be kept in mind while considering lesions of the pituitary region, as evident by typical radiological features, in spite of being located in a less likely site.

Keywords: Anterior sellar colloid cyst, Incidental finding, Transnasal transsphenoidal excision

INTRODUCTION

Colloid cysts are common benign lesions of the third ventricle, with a reported incidence of 0.2–2%, usually arising from the roof.[3] Rarely reported extraventricular locations include optic chiasm, olfactory groove, pituitary gland, fourth ventricle, cerebellum, brainstem, cerebral hemisphere, and velum interpositum.[5] Although benign, they can lead to drastic and lethal complications, if left untreated. In this report, we highlight the fact that they can mimic pituitary adenomas, thrombosed aneurysm, lymphocytic hypophysitis, and optic-hypothalamic glioma on radiological and clinical profile, only to be diagnosed as colloid cyst intraoperatively, that can safely be treated by a routine minimally invasive procedure.

ILLUSTRATIVE CASE

A 45-year-old previously healthy female presented to us with nonspecific holocranial headache for 2 years. After the failure of initial management with analgesics, and ruling out other nonorganic causes of headache, she was evaluated with magnetic resonance imaging (MRI) brain and was found to have sinusitis [Figure 1a], showing T2 hyperintense signal along the

wall of the sphenoid sinus and partially along ethmoid sinus, with an incidental finding of a hypointense lesion in anterior sella pushing the whole of normal pituitary gland inferoposteriorly. Her routine blood investigations, hormonal assay, visual acuity, visual fields, and menstrual and obstetric history were all normal, except for a slightly elevated white blood cell count (13,000/μL). In the setting of clinical profile, radiological findings, and elevated total leukocyte count, she was treated for sinusitis and started on steroids keeping a diagnosis of lymphocytic hypophysitis in mind. After a month, she had symptomatic relief in headache, and a follow-up contrast MRI was done which was suggestive of resolved sinusitis, but no interval change in the lesion [Figure 1b], which was hyperintense on T1, hypointense on T2, with no contrast enhancement and a densely hypointense nodule in the center, which was mildly enhancing. Further, a contrast computed tomography (CT) brain was done, showing nonenhancing hyperdense lesions without calcifications [Figure 1c]. Considering the possibility of a thrombosed aneurysm, cerebral digital subtraction angiography was done to rule it out, which showed no abnormal findings. Since there was no resolution in the size of the lesion on steroid therapy, it was discontinued and we proceeded with microscopic excision through the transnasal transsphenoidal route to obtain a tissue diagnosis, keeping in mind various differential diagnoses including nonfunctional pituitary adenoma, hypothalamic glioma, and Rathke cleft cyst. Intraoperatively, as soon as the dura was opened, viscous white mucoid content oozed out [Figure 2a], a thin

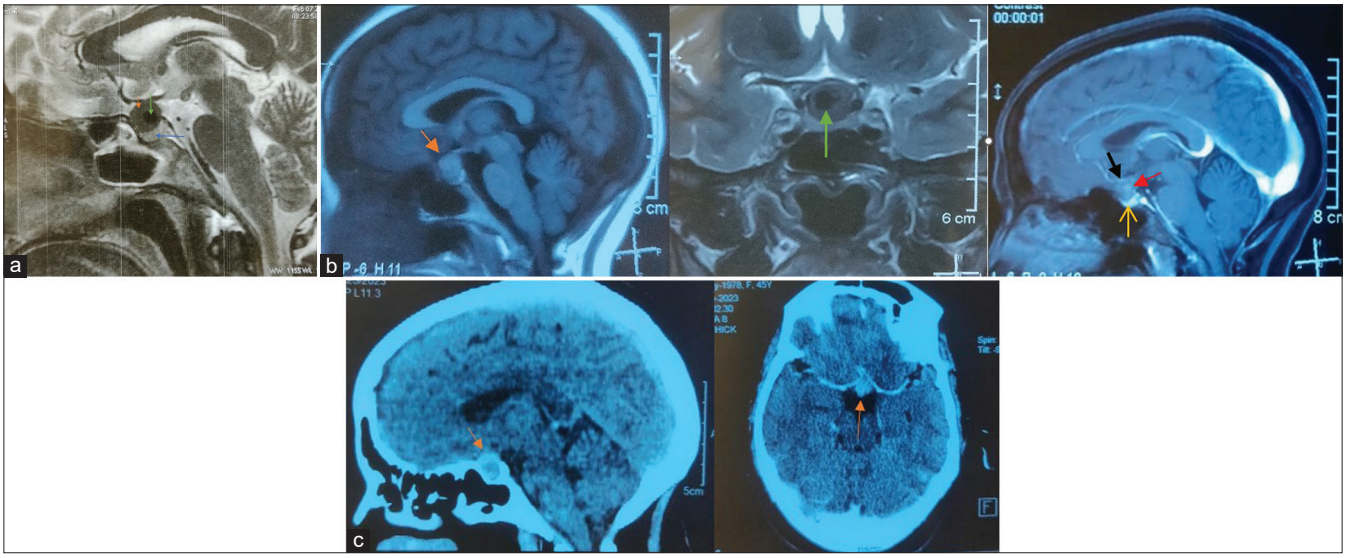

Figure 1: (a) Magnetic resonance imaging brain sagittal T2 sequence showing hyperintense signal along the wall of the sphenoid and partially along the ethmoid sinus, suggestive of sinusitis, and a hypodense lesion in the sellar region (orange arrow) with dense central hypodensity (dot sign) (green arrow), compressing the normal pituitary gland inferoposteriorly (blue arrow). (b) Interval magnetic resonance imaging brain sagittal T1 sequence showing hyperintense sellar lesion (orange arrow), coronal T2 sequence showing resolved sinusitis and hypointense sellar lesion with central nodule (green arrow), and a sagittal post-contrast sequence showing nonenhancing lesion (black arrow) and mildly enhancing nodule (red arrow) with normal enhancing pituitary gland (yellow arrow). (c) Contrast-enhanced computed tomography brain showing a hyperdense lesion in sella (orange arrow) in sagittal and axial sections.

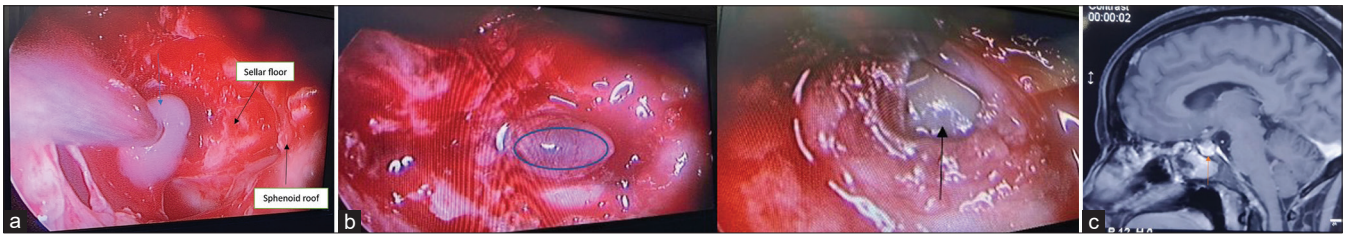

Figure 2: (a) Intraoperative microscopic image showing viscous white mucoid content (blue arrow) oozing out. (b) Intraoperative microscopic image showing thin translucent capsule (marked in blue oval) and a firm yellow nodule (arrow). (c) Postoperative contrast-enhanced magnetic resonance imaging brain sagittal section showed no residual lesion and a normal enhancing pituitary gland (orange arrow), which has expanded after the excision of the lesion.

Table 1: Characteristics of sellar colloid cysts.[2,3,6]

Cyst characteristics	Our case (*n*=1)	Nomikos *et al*.[6] (*n*=18)	Bladowska *et al*.[2] (*n*=1)	Guduk *et al*.[3] (*n*=1)
Presentation	Incidental	Menstrual irregularities, galactorrhea, headache	Headache, visual disturbance	Incidental
Hormonal assay	Normal	Hyperprolactinemia, hypogonadism, panhypopituitarism	Insignificant hyperprolactinemia	Slight hypoprolactinemia and hypothyroidism
Location within sella	Anteriorly	Between anterior and posterior pituitary	Between anterior and posterior pituitary	Between anterior and posterior pituitary
Plain CT density	Hyperdense without calcification	Hypodense lesion	–	–
Sellar turcica	Normal	Normal to slightly enlarged	–	–
T1 MRI	Hyperintense	Hypointense	Hypointense	Iso to hyperintense
T2 MRI	Hypointense	-	Hyperintense periphery and hypointense center	Hypointense
Post contrast cyst enhancement	Nonenhancing	Nonenhancing	Nonenhancing	Nonenhancing
Dot sign	Present. Mildly enhancing central nodule	Absent	Present. Non enhancing nodule	Absent
Surgical treatment	Transnasal transsphenoidal route	Sublabial paraseptal transsphenoidal route	Transnasal transsphenoidal route	Transnasal transsphenoidal route
Excision	Complete	Complete	Complete	Complete

MRI: Magnetic resonance imaging, CT: Computed tomography. *n* = Total number of cases

translucent capsule was seen along with a firm yellow nodule [Figure 2b], which was easily dissected off and normal hypophysis visualized. Her postoperative course was uneventful, with a contrast-enhanced MRI after a month showing complete excision of the lesion [Figure 2c]. Histopathology revealed colloid-like material adherent to peripheral normal pituitary parenchyma, cinching the diagnosis.

DISCUSSION

Colloid cysts are usually found within the ventricular system, particularly the roof of third ventricle.[3] Extraventricular involvement is rare and includes optic chiasm, olfactory groove, pituitary gland, fourth ventricle, cerebellum, brainstem, cerebral hemisphere, and velum interpositum.[5] Histopathologic examination is the standard diagnostic method showing an outer fibrous capsule and an inner lining of squamous, cuboidal, or columnar epithelium, containing gelatinous material showing periodic acid-Schiff (PAS) staining.[4] On CT imaging, the lesion is usually hyperdense, but can also be hypo- or isodense. Depending on the composition of cyst contents, that is cerebrospinal fluid-like or mucoid, they can appear hypo or hyperintense on T1 and T2 weighted sequence, without any enhancement.[1] The MRI characteristics [Table 1] of these lesions are highly specific, irrespective of the location.[7] In our case, the lesion was uniformly hyperintense on T1 and heterogeneously hypointense on T2 with a profoundly hypointense nodule in the center (dot sign) showing mild contrast enhancement with a nonenhancing cyst wall. Challenging differential diagnosis includes arachnoid cyst, Rathke cleft cyst, cystic pituitary adenoma, craniopharyngioma, empty sella, pituitary necrosis, hypophysitis, hypothalamic optic glioma, and aneurysm.[1,5] Colloid cysts are usually pars intermedia cysts, located between the anterior and posterior pituitary, not communicating with subarachnoid space, with incompletely understood pathogenesis, and few authors suggest them to be a consequence of natural cell degeneration or necrosis due to ischemia or poorly vascularized intermediate part of pituitary.[6,8] However, in our case, the cyst was located anteriorly, displacing both the anterior and posterior pituitary inferoposteriorly. Due to their small size, they are usually asymptomatic but can lead to headaches, hypopituitarism, visual disturbances due to chiasmatic compression, pituitary apoplexy, etc.[2] Treatment options include watchful observation for asymptomatic lesions, and microsurgical excision through transnasal transsphenoidal and traditional open routes. Recently, endoscopic excision through transnasal transsphenoidal is gaining popularity, due to better visualization and safe resection, leading to decreased postoperative complications.

Observations

Here, in spite of radiological characteristics suggestive of a typical colloid cyst, we did not consider it in our differential

diagnosis initially, as the location was an anterior sellar region, which is highly unlikely for a colloid cyst. The diagnosis was made intraoperatively.

CONCLUSION

Colloid cyst of the pituitary gland is a very rare pathology, with a wide range of presentation from being asymptomatic to profound neurological deficits and hormonal disturbances. They need to be kept in mind while considering the differential diagnosis of sellar suprasellar lesions, especially when the lesion appears hypointense on T2 without contrast enhancement and a dot sign, that is central low signal intensity on T2 as compared to the periphery of the lesion. MRI characteristics of such lesions are highly specific, irrespective of the location, and in spite of these being found in uncommon locations. These can be safely managed by minimally invasive transnasal transsphenoidal routes, either microscopic or endoscopic.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

Financial support and sponsorship

Publication of this article was made possible by the James I. and Carolyn R. Ausman Educational Foundation.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The author(s) confirms that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

REFERENCES

1. Bender B, Honegger JB, Beschorner R, Ernemann U, Horger M. MR imaging findings in colloid cysts of the sellar region: Comparison with colloid cysts of the third ventricle and Rathke's cleft cysts. Acad Radiol 2013;20:1457-65.
2. Bladowska J, Bednarek-Tupikowska G, Biel A, Sąsiadek M. Colloid cyst of the pituitary gland: Case report and literature review. Pol J Radiol 2010;75:88-93.
3. Guduk M, Sun HI, Sav MA, Berkman Z. Pituitary colloid cyst. J Craniofac Surg 2017;28:e166-8.
4. Lach B, Scheithauer BW, Gregor A, Wick MR. Colloid cyst of the third ventricle. A comparative immunohistochemical study of neuraxis cysts and choroid plexus epithelium. J Neurosurg 1993;78:101-11.
5. Laidlaw J, Kaye AH, Kaye AH, Laws ER. Colloid cysts. Brain tumors: An encyclopedic approach. London: Churchill Livingstone; 2012.
6. Nomikos P, Buchfelder M, Fahlbusch R. Intra- and suprasellar colloid cysts. Pituitary 1999;2:123-6.
7. Ravindran K, Sim K, Gaillard F. Magnetic resonance characterization of the "dot sign" in colloid cysts of the third ventricle. J Clin Neurosci 2019;62:133-7.
8. Zieliński G, Podgórski JK, Siwik J, Warczyńska A, Zgliczyński W. Colloid cysts of the pituitary gland. Neurol Neurochir Pol 2002;36:293-306.

How to cite this article: Chauhan B, Dholakia B, Hirani C, Nazir W, Singh D, Singh H. Sellar colloid cyst: Peculiar radiological characteristics of a common lesion at an uncommon location. Surg Neurol Int 2023;14:327.