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CASE REPORT

Giant sialolith in the left submandibular gland: a case report

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Abstract:

Sialolithiasis is the most common cause of salivary gland obstruction, predominantly affecting the submandibular gland. Giant sialoliths are rare and may pose diagnostic challenges, particularly when symptoms are atypical. This case report describes a 40-year-old female who presented with a two-month history of a foreign body sensation in the floor of the mouth, associated with intermittent purulent discharge. Clinical examination and cone-beam computed tomography revealed a large radiopaque mass measuring 23 × 10 × 6 mm in the left submandibular gland region. The lesion was successfully managed through intraoral surgical removal, followed by uneventful healing. Histopathological examination confirmed the diagnosis of sialolithiasis, demonstrating ductal alterations and chronic inflammatory changes consistent with long-standing obstruction. Despite the relatively short duration of symptoms, the size of the calculus suggests prolonged asymptomatic growth. This report highlights the importance of recognizing atypical subjective complaints as potential indicators of salivary duct obstruction and supports conservative, gland-preserving surgical management for giant submandibular sialoliths to achieve favorable functional outcomes.

Keywords: Salivary gland calculi; Submandibular gland; Salivary calculi; Surgery, oral; Case reports.

INTRODUCTION

Sialolithiasis is a pathological condition characterized by the formation of calcified deposits within the ductal system or parenchyma of the salivary glands. The submandibular gland is affected in most cases, accounting for approximately 80 to 95 percent, due to its anatomical and physiological characteristics. These include the long and tortuous course of Wharton's duct, the alkaline pH and higher viscosity of saliva, and the increased concentration of calcium and phosphate[1,2].

Clinically, patients commonly present with pain and glandular swelling that worsen during meals, accompanied by a sensation of obstruction and recurrent episodes of sialadenitis[3,4]. While small calculi are relatively common, giant sialoliths exceeding 15–20 mm are uncommon lesions that may create significant diagnostic and therapeutic challenges[4]. Such cases often require surgical intervention when conservative approaches are ineffective[5,6]. Large sialoliths may lead to complications including recurrent infections, chronic inflammation, ductal rupture, and significant discomfort, ultimately impairing quality of life[7].

Statement of Clinical Significance
Giant submandibular sialoliths may remain asymptomatic for years and present with atypical complaints such as a foreign body sensation. Early recognition, combined with appropriate imaging, allows for conservative intraoral removal, preserving function and preventing chronic infection or unnecessary gland excision.

The present report aims to describe a clinical case of a giant submandibular sialolith in a female patient, emphasizing its clinical presentation, imaging findings, surgical management, and histopathological features, and postoperative follows-up, as well as the diagnostic value of atypical subjective symptoms in salivary gland disorders.

This study is presented as a single-patient clinical case report, structured according to the CARE (CAse REport) guidelines for medical and dental case documentation. All clinical data were obtained directly from the patient's medical records, clinical examination, and histopathological analysis conducted at the Oral Pathology Service of the School of Dentistry, University of São Paulo. Written informed consent was obtained for

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both treatment and publication of anonymized clinical, imaging, and histopathological data.

CASE REPORT

A 40-year-old female patient was referred to the Center for Oral Diagnosis (CDO) after an incidental radiographic finding identified during computed tomography requested for implant planning. The examination revealed a well-defined radiopaque mass in the left submandibular region. The patient reported a two-month history of a "red bump" in the floor of the mouth, occasionally associated with purulent discharge. She also described a persistent foreign body sensation during swallowing, likened to a "fish bone". The patient denied systemic diseases, smoking habits, previous salivary gland disorders, medication use, or relevant family history.

Intraoral examination revealed a single, well-defined nodular lesion in the left sublingual region. The lesion was covered by intact mucosa with normal coloration and exhibited mild tenderness upon palpation, without evidence of ulceration or spontaneous drainage during examination (Figure 1A). No cervical lymphadenopathy or extraoral swelling was noted. Cone-beam computed tomography

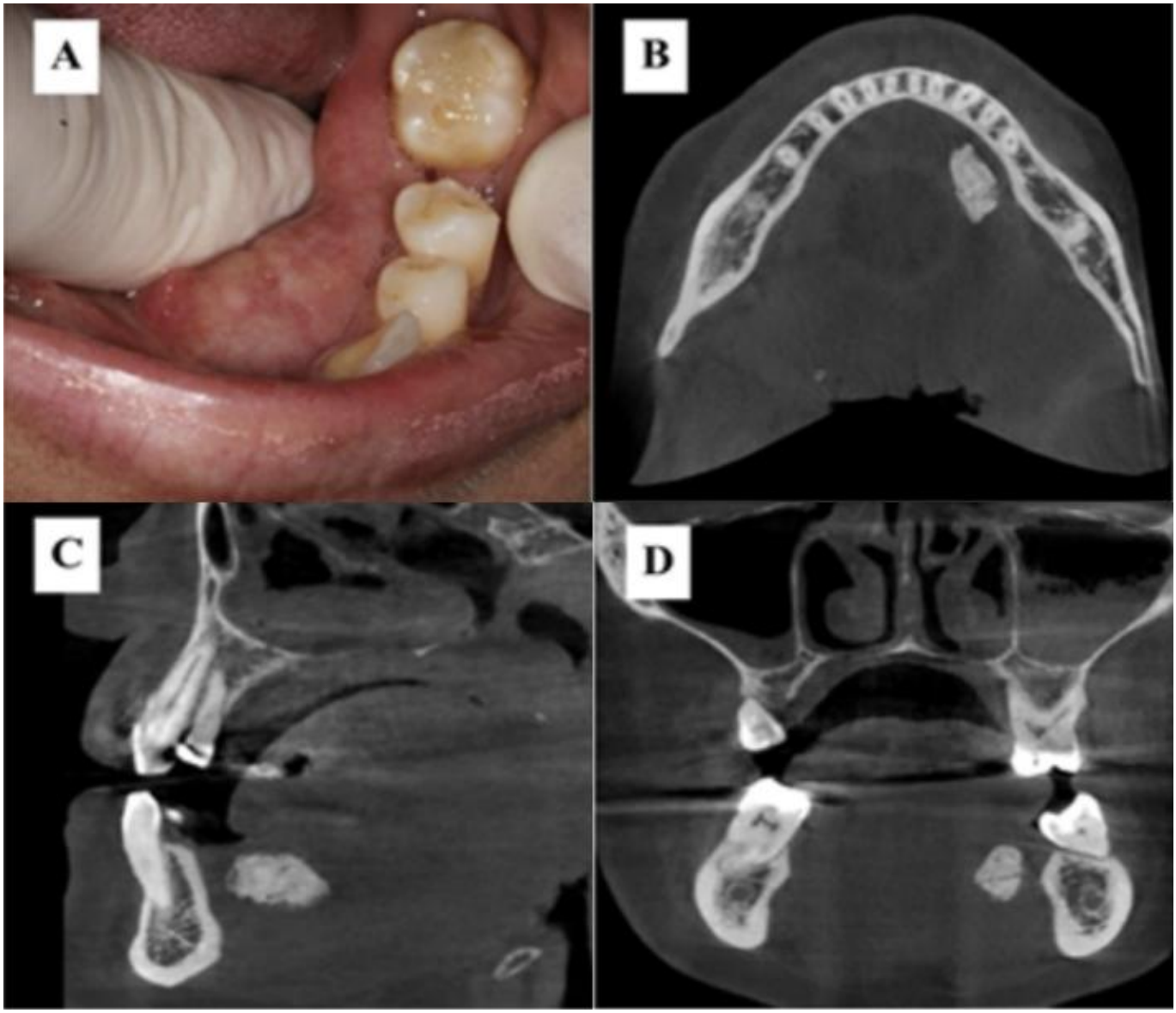

Figure 1. Clinical examination and Cone-beam computed tomography (CBCT) images showing a radiopaque mass compatible with a sialolith in different planes: **(A)** Preoperative intraoral aspect showing sublingual nodule. Cone-beam computed tomography: **(B)** axial view. **(C)** Sagital view. **(D)** Coronal view.

(CBCT) was performed to determine the precise location and dimensions of the mineralized mass. The imaging confirmed a radiopaque entity measuring approximately 23 × 10 × 6 mm, consistent with a sialolith (Figures 1B, 1C, and 1D).

Surgical access was obtained through an intraoral incision under local anesthesia. Due to the patient's history of intermittent purulent discharge suggestive of secondary bacterial sialadenitis associated with chronic ductal obstruction, perioperative antibiotic therapy with amoxicillin/clavulanate (875/125 mg) was prescribed. This approach aimed to reduce bacterial load and minimize the risk of postoperative infectious complications associated with salivary stasis and surgical manipulation of an already contaminated ductal system. An intraoral longitudinal incision was performed under local anesthesia to expose the ductal calculus. (Figure 2A), carefully excised (Figure 2B), and the site was closed with primary sutures (Figure 2C). The macroscopic specimen confirmed the dimension of 23 × 10 × 6 mm (Figure 2D). Postoperative management included 0.12% chlorhexidine mouthwashes and local hygiene with cotton swabs. At the 7-day follow-up, the patient exhibited uneventful healing with minimal inflammation and no signs of infection. Sutures were removed after 14 days. Long-term follow-up demonstrated complete healing, preserved salivary gland function, and absence of recurrence after one year (Table 1).

Given the lesion's size and the presence of chronic inflammatory changes, histopathological analysis was performed to confirm the diagnosis and exclude other ductal pathologies (Table 2). Microscopic analysis revealed salivary gland parenchyma with ductal dilation, squamous metaplasia, and moderate mononuclear inflammatory infiltrate. Basophilic areas consistent with mineralized material were also identified. These microscopic findings are compatible with chronic obstructive sialadenitis secondary to long-standing mineralized deposition within the salivary duct system (Figure 3).

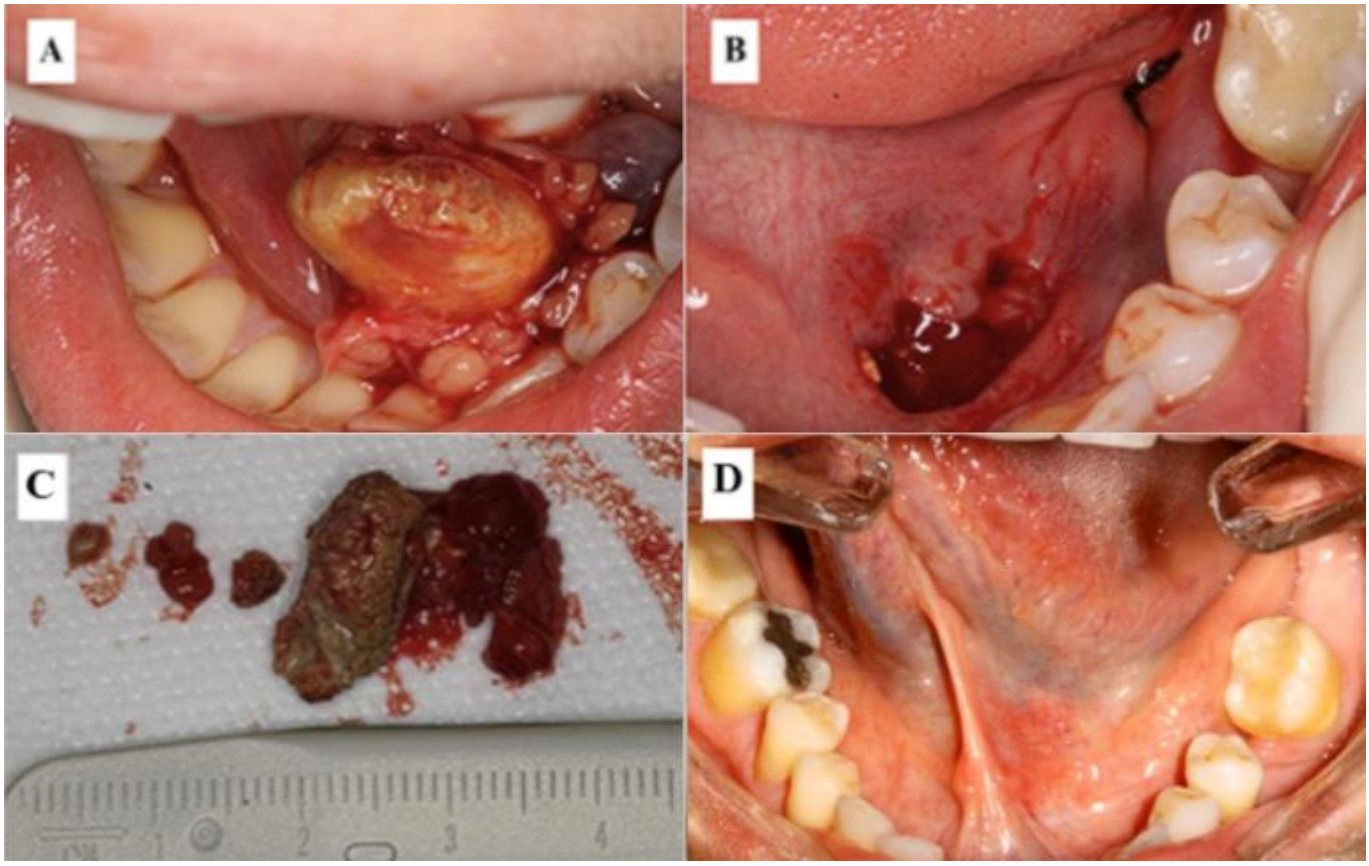

Figure 2. Intraoral clinical sequence of surgical management of submandibular sialolithiasis. **(A)** Intraoral view showing the exposure of a large yellowish sialolith in the floor of the mouth. **(B)** Surgical removal of the sialolith through a mucosal incision over Wharton's duct. **(C)** Excised sialolith placed on a ruler showing its dimensions (23 × 10 × 6 mm). **(D)** Postoperative intraoral view demonstrating complete healing of the surgical site, with restoration of normal mucosal appearance, absence of fibrosis, and no evidence of recurrence after one year.

Table 1. Patient Timeline.

Time	Clinical Event
2 months before diagnosis	Foreign body sensation and purulent discharge
Initial CT scan	Incidental radiopaque lesion detected
Clinical examination	Sublingual nodular lesion observed
CBCT	23 × 10 × 6 mm sialolith identified
Surgery	Intraoral removal performed
7 days	Uneventful healing
14 days	Suture removal
Long-term follow-up	No recurrence/symptoms

DISCUSSION

Sialolithiasis most frequently affects individuals between the fourth and seventh decades of life and shows a slight male predominance[8,9]. Epidemiological studies, including data from Brazil, consistently indicate that the submandibular gland is the most commonly involved site, accounting for approximately 80 to 90 percent of cases[10,11]. Although submandibular sialolithiasis demonstrates a slight male predominance in epidemiological studies, the present case remains consistent with the commonly affected age group described in the literature[12]. The high prevalence of submandibular sialolithiasis is attributed to several factors, including the long

Table 2. Differential diagnoses included ranula, phlebolith, calcified lymph node, foreign body impaction, and salivary gland neoplasms. However, the radiographic appearance and ductal location strongly supported the diagnosis of sialolithiasis.

Condition	Clinical Features	Imaging Findings	Distinguishing Characteristics
Ranula	Fluctuant bluish swelling	Cystic lesion	Non-calcified
Phlebolith	Firm nodules	Multiple calcifications	Associated vascular lesion
Calcified lymph node	Asymptomatic	Irregular calcification	Cervical location
Foreign body impaction	Acute pain	Variable radiopacity	Trauma history
Pleomorphic adenoma	Slow-growing mass	Soft tissue lesion	Neoplastic behavior
Sialolithiasis	Pain/swelling during meals	Ductal radiopacity	Salivary obstruction

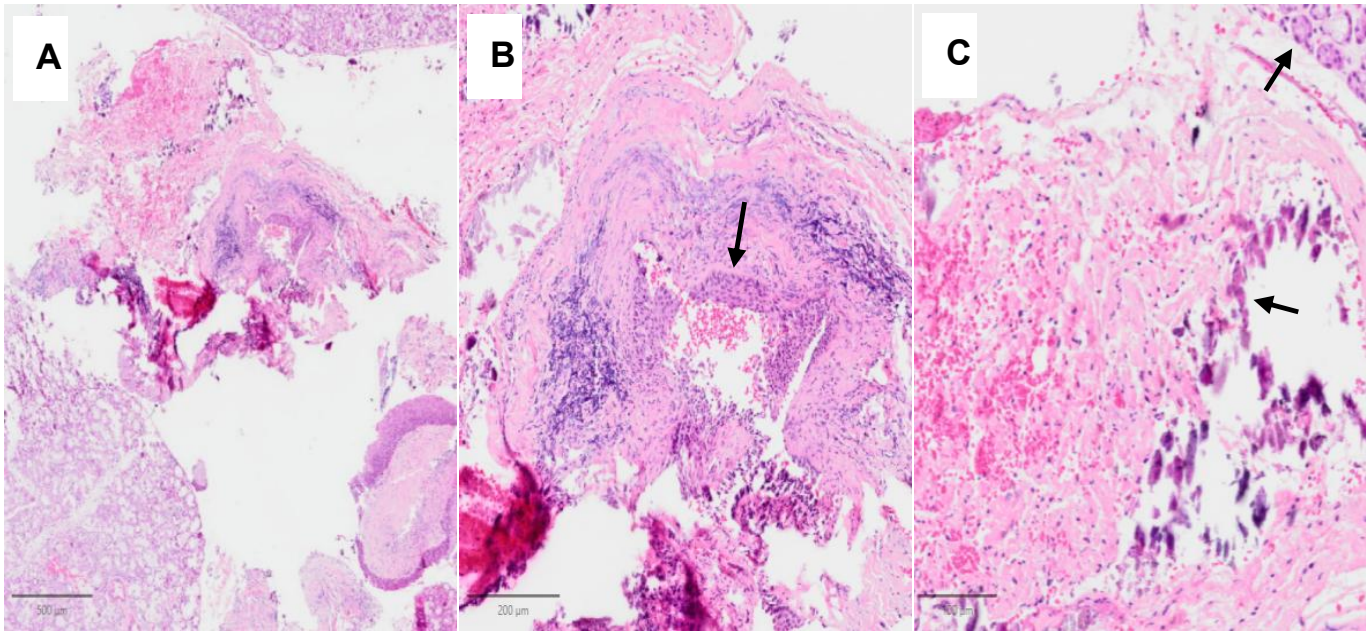

Figure 3. Histopathological features of the submandibular gland sialolith (H&E stain). **(A)** Photomicrograph showing an overview of the submandibular gland biopsy (Scale bar: 500 µm). **(B)** Ductal epithelium exhibiting squamous metaplasia (Scale bar: 200µm). **(C)** Salivary gland ducts and basophilic material suggestive of calcification (consistent with a sialolith) (Scale bar: 100 µm).

and upward course of Wharton's duct, the alkaline pH of the saliva, and its high concentration of calcium and mucin compared to parotid secretions.

The term giant sialolith is generally applied to calculi exceeding 15 mm in length or weighing more than 1 g[13]. As mentioned before, the occurrence of such large stones in the submandibular gland is attributed to the unique anatomy of Wharton's duct, which is longer and wider than the parotid duct, allowing for the gradual expansion and accumulation of mineralized material[14]. The clinical and histopathological findings observed in this case are consistent with the classical descriptions of submandibular sialolithiasis in the literature, particularly in terms of symptomatology, lesion location, and radiographic features[15]. As previously described by Kim et al.[15], partial ductal obstruction permits continued salivary flow around the calculus, preventing acute meal-related symptoms and allowing gradual, asymptomatic enlargement over many years.

A striking feature of this case is the discrepancy between the significant dimensions of the sialolith (23 mm) and the short duration of the patient's symptoms (two months). According to recent literature, the average growth rate of salivary stones is estimated at approximately 1 mm per year[16]. This suggests that a calculus of this magnitude likely developed over a period of two decades, remaining clinically silent for most of its expansion[17]. The absence of acute symptoms can be explained by the partial obstruction mechanism, where the stone allows sufficient salivary flow around its periphery to prevent the classic "meal-time syndrome[18]".

The recent onset of a foreign body sensation and purulent discharge likely indicates a threshold of ductal irritation or secondary infection, rather than the initial phase of formation. The patient's subjective complaint of a recurrent pain sensation. This perception likely stems from localized ductal distension or mechanical irritation caused by the large calculus against the sensitive mucosa of the floor of the mouth. Such unique sensory reports are sparsely documented in recent literature, where most patients present with the more common complaints of swelling or pain. This highlights the necessity of a meticulous clinical history to differentiate sialolithiasis from the actual ingestion or impaction of a foreign body[19].

Histopathologically, the specimen exhibited the classic architecture of sialolithiasis, characterized by concentric lamellar mineralization surrounding an organic nidus. These findings were accompanied by secondary changes in the adjacent tissues, including ductal ectasia, squamous metaplasia, and chronic inflammatory infiltrate within the salivary parenchyma all of which are common sequelae of long-standing obstructive sialadenitis. The dimensions of the excised mass ($23 \times 10 \times 6$ mm) align with the established criteria for "giant" sialoliths, reinforcing the rare nature of this "megalith" and its successful management via an intraoral approach[8]. The presence of ductal ectasia, chronic inflammatory infiltrate, and squamous metaplasia reinforces the hypothesis of prolonged obstruction and slow progressive enlargement of the calculus over several years.

The management of giant submandibular sialoliths primarily aims to resolve the ductal obstruction while preserving the functional integrity of the salivary gland. Surgical excision via an intraoral sialolithotomy remains the gold standard for stones of this magnitude that are palpable and accessible through the floor of the mouth. [15] Modern therapeutic protocols strongly emphasize gland-preserving approaches over radical sialoadenectomy, particularly in younger patients, to maintain adequate salivary flow[16].

This case underscores the clinical significance of recognizing atypical subjective symptoms, such as a persistent foreign body sensation, as a diagnostic clue for obstructive salivary pathologies. A multidisciplinary approach, combined with precise imaging and conservative surgical management, effectively prevents long-term glandular dysfunction and improves patient quality of life[20].

FINAL CONSIDERATIONS OR CONCLUSION

Giant submandibular sialolithiasis is an uncommon but clinically significant entity that can mimic various other oral pathologies. An accurate diagnosis, fundamentally supported by advanced imaging and confirmed through histopathological analysis, is essential to ensure appropriate management.

This case demonstrates that giant submandibular sialoliths may remain asymptomatic for prolonged periods and occasionally present with atypical symptoms such as foreign body sensation. Careful clinical evaluation, advanced imaging, and histopathological confirmation are essential for accurate diagnosis. Conservative intraoral management may successfully preserve glandular function even in large ductal calculi, and improving patient quality of life.

Patient perspective

"The patient reported relief of the foreign body sensation immediately after surgery and expressed satisfaction with the conservative treatment and postoperative recovery."

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AUTHORS' CONTRIBUTIONS

PSP: Clinical Documentation, Conceptualization, Data Collection, Supervision, Histopathological Analysis, Critical Revision. ARGJ: Manuscript Writing, Data Interpretation, Literature Review. CMV: Manuscript Writing, Data Interpretation, Literature Review. IESM: Manuscript Writing, Data Interpretation, Literature Review. CAL: Clinical Documentation, Conceptualization, Interpretation of Findings, Critical Revision. CVE: Clinical Documentation, Conceptualization, Interpretation of Findings, Critical Revision.

CONFLICT OF INTEREST STATEMENT

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Competing interests: The authors declare that they have no known competing financial interests or personal relationships which could have appeared to influence the work reported in this article.

Ethics approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

DATA AVAILABILITY STATEMENT

All data sets were generated or analyzed in the current study.

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