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CASE REPORT

A SILENT GROWTH: RARE SPINDLE CELL FIBROMA OF THE BUCCAL MUCOSAGeetla Santhosh Reddy¹, Chembolu Neelima², Gundlapally Anusha Reddy³, Donekal Guru Charan⁴, Ravikumar Aishwarya⁵, Vemuganti Supraja⁶, Ajmera Prem Sagar⁷, Sarah Aziz Mohammed⁸¹MDS, Professor and Head of the Department, Department of Oral and Maxillofacial Surgery, Malla Reddy Dental College for Women, Malla Reddy Vishwavidyapeeth (Deemed to be University) Suraram, Hyderabad, 500055, Telangana, India.

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Corresponding Author: Gundlapally Anusha Reddy, Senior Resident, Oral and Maxillofacial Surgery, Government Dental College and Hospital, Hyderabad, Telangana, India, Email id: anushareddy0296@gmail.com, phone number: 8897468945**Received:** Mar. 15 2026; **Accepted:** Apr. 18, 2026; **Published:** Apr. 25, 2026**ABSTRACT**

Spindle cell neoplasms of the oral cavity represent a rare and diagnostically challenging group of lesions characterized by the proliferation of elongated mesenchymal cells with variable differentiation, including fibroblastic, myofibroblastic, neural, and epithelial lineages. Although these lesions account for less than 1% of oral tumors and approximately 3% of salivary gland neoplasms, their clinical importance lies in their ability to mimic a wide range of benign and malignant conditions, complicating diagnosis and management. Accurate identification requires integration of clinical, radiological, and histopathological findings. We report a case of a 21-year-old male with a two-year history of a painless, slow-growing swelling in the right buccal mucosa, an uncommon site for such lesions. Clinical and imaging evaluation, including ultrasonography, computed tomography, and magnetic resonance imaging, revealed a well-defined soft tissue mass without bone involvement, suggestive of a benign process. Differential diagnoses included fibroma, neurofibroma, schwannoma, and myofibroma. Surgical excision was performed with uneventful healing. Histopathological examination demonstrated spindle-shaped fibroblasts in a collagenous stroma without atypia or mitotic activity, confirming spindle cell fibroma. Immunohistochemistry was not required. Early diagnosis and complete excision ensure excellent prognosis.

Keywords: Spindle cell neoplasm, Oral cavity tumor, Buccal mucosa lesion, Spindle cell fibroma, Benign oral tumor**INTRODUCTION**

Spindle cell lesions of the oral cavity constitute a heterogeneous and diagnostically challenging group of

neoplasms characterized by the predominance of elongated, fusiform-shaped cells resembling fibroblasts or myofibroblasts¹. These lesions arise from a variety of tissue origins, including mesenchymal, epithelial,

neural, muscular, vascular, and odontogenic components, contributing to their broad morphological spectrum and diagnostic complexity^{3,4}. The overlapping histopathological features between benign, reactive, and malignant spindle cell proliferations further complicate accurate diagnosis and clinical decision-making^{2,8}. Consequently, the occurrence of spindle cell tumors in the head and neck region presents a significant diagnostic challenge and adds complexity to treatment planning.

From a biological standpoint, spindle cells are derived from mesenchymal tissue and play a critical role in connective tissue architecture and repair. However, neoplastic transformation of these cells may result in a wide spectrum of lesions, ranging from benign entities such as fibroma and myofibroma to aggressive malignancies including spindle cell carcinoma and various sarcomas^{5,8}.

Molecular mechanisms such as epithelial–mesenchymal transition, along with alterations in cell adhesion molecules including cadherins, have been implicated in tumor progression and phenotypic transformation, particularly in malignant spindle cell lesions⁶.

Spindle cell neoplasms of the oral cavity are relatively uncommon, accounting for less than 1% of all oral tumors and approximately 3% of salivary gland neoplasms⁷. Despite their low incidence, they are of considerable clinical importance due to their ability to mimic a wide range of benign and malignant conditions, often leading to diagnostic uncertainty and challenges in therapeutic decision-making².

A large clinicopathological review has shown that benign spindle cell lesions are more frequently encountered than malignant ones, with neural and fibroblastic tumors representing the predominant categories⁷.

To facilitate diagnostic accuracy and improve classification, a histopathology-based categorization system has been proposed, classifying oral spindle cell neoplasms into neural, myofibroblastic, muscular, fibroblastic, vascular, epithelial, odontogenic, and miscellaneous types⁴.

This classification, based on the predominance of spindle cells and their differentiation patterns, provides a practical framework for understanding the biological behavior of these lesions¹⁻⁴ (**Figure 1**).



Figure 1. Classification of oral spindle cell neoplasms based on predominant histopathological differentiation

In addition, immunohistochemistry plays a crucial role in identifying the cellular origin and distinguishing morphologically overlapping entities, thereby enhancing diagnostic precision and guiding appropriate management^{2,3}.

Beyond histopathology, imaging modalities play an essential role in the evaluation of oral soft tissue lesions. Advanced imaging techniques such as magnetic resonance imaging, particularly with specialized sequences like short tau inversion recovery, provide superior soft tissue contrast and allow precise delineation of lesion extent and its relationship with adjacent anatomical structures, thereby aiding in preoperative planning¹¹. Furthermore, emerging minimally invasive treatment approaches, including percutaneous cryoablation, have been explored in selected cases as alternatives to conventional surgical management¹².

Despite these diagnostic and therapeutic advancements, spindle cell fibroma occurring in the buccal mucosa remains an uncommon presentation with limited documentation in the literature. The rarity of this anatomical location, combined with overlapping clinical and radiological features, necessitates a comprehensive and multidisciplinary diagnostic approach.

In this context, the present case report describes a benign spindle cell fibroma in a 21-year-old male with a two-year history of a solitary, smooth-surfaced, slow-growing nodule in the right buccal mucosa—an unusual site for such lesions. This report highlights its clinical, radiological, and histopathological characteristics and

emphasizes the importance of accurate diagnosis and appropriate management of rare oral spindle cell neoplasms.

CASE REPORT

A 21-year-old male patient presented to the Department of Oral and Maxillofacial Surgery with a chief complaint of a painless swelling on the right side of the cheek that had been progressively increasing in size over a period of two years. The patient reported that the swelling was initially small and had gradually enlarged to its present dimensions. There was no associated pain, discharge, or functional limitation. The patient's medical, dental, family, and personal histories were non-contributory.

On extraoral examination, a solitary, well-defined, oval-shaped swelling measuring approximately 4 × 4 cm was observed over the right malar region. The swelling was located inferior to the zygomatic arch, approximately 3 cm lateral to the tragus of the ear, 3 cm medial to the nasolabial fold, and about 2 cm superior to the lower border of the mandible. The overlying skin appeared normal, with no signs of erythema, ulceration, or sinus formation. On palpation, the lesion was non-tender, firm to hard in consistency, slightly mobile, and not fixed to the underlying or overlying structures. No regional lymphadenopathy was detected.

Intraoral examination revealed a submucosal swelling in the right buccal space, with intact and normal-appearing overlying mucosa (Figure 2).

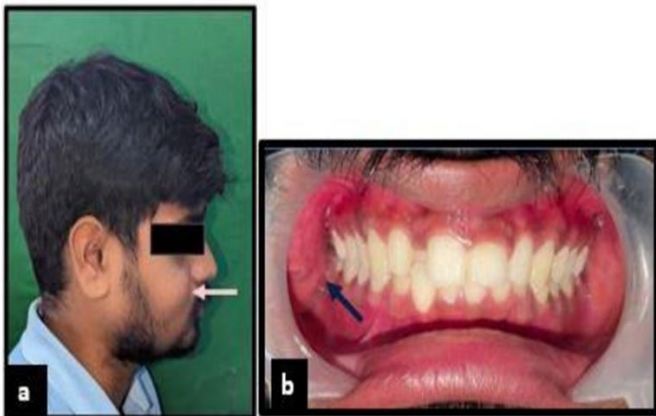


Figure 2. (a) Extraoral photograph of patients showing swelling over the right malar process of the face. (b) Intra-oral photograph showing submucosal swelling in the right buccal space, overlying mucosa is normal.

The opening of the parotid (Stensen's) duct was patent, with normal salivary flow. There were no abnormalities associated with the adjacent maxillary posterior teeth.

The patient demonstrated an adequate mouth opening of approximately 3.5 cm.

Panoramic radiography (orthopantomogram) did not reveal any evidence of adjacent bony involvement or pathological changes (Figure 3).



Figure 3. Panoramic radiograph (orthopantomogram) demonstrating no evidence of underlying bony involvement or pathological bone changes associated with the lesion.

Fine-needle aspiration cytology (FNAC) could not be performed due to the firm consistency of the lesion. Ultrasonographic examination demonstrated a well-defined, heterogeneous hypoechoic soft tissue lesion.

Computed tomography (CT) imaging revealed a well-circumscribed, round, hypodense lesion with small foci of calcification located within the right masseter muscle space. The lesion caused splaying of the surrounding muscle fibers and mild scalloping of the posterolateral wall of the maxilla, without evidence of cortical breach or bone destruction. The lesion extended into the buccal space (Figure 4).



Figure 4. Computed tomography (CT) image showing a well-defined hypodense lesion in the right masseteric space with small foci of calcification. The lesion causes splaying of adjacent muscle fibers and mild scalloping of the posterolateral maxillary bone without cortical destruction.

Magnetic resonance imaging (MRI) demonstrated a well-defined lesion with altered signal intensity, appearing hypointense on T1-weighted, T2-weighted, and STIR sequences. The lesion was localized within the right masseteric space, causing displacement of adjacent muscle fibers and scalloping of the posterolateral maxillary surface, without any signs of bone invasion (Figure 5).

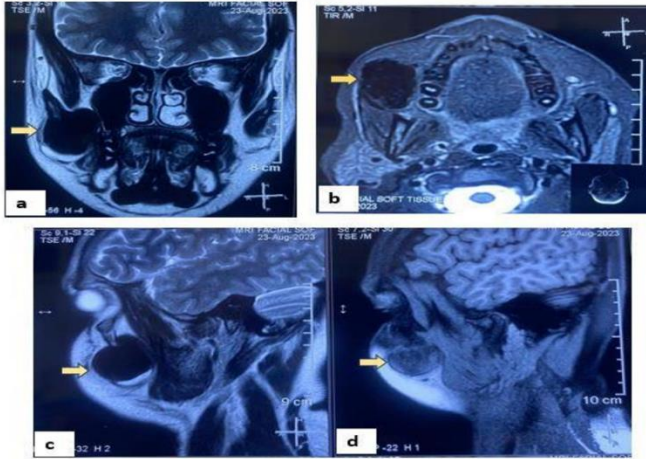


Figure 5. Magnetic resonance imaging (MRI) showing a well-circumscribed lesion in the right masseteric space. The lesion appears hypointense on T1-weighted, T2-weighted, and STIR sequences, with no evidence of bone invasion and displacement of adjacent soft tissue structures.

Based on the clinical and radiological findings, a provisional diagnosis of a benign soft tissue tumor was made. The differential diagnoses included fibroma, spindle cell tumor, lipoma, neurofibroma, schwannoma, myofibroma, solitary fibrous tumor, and spindle cell lipoma.

The patient underwent complete surgical excision of the lesion under general anesthesia (Figure 6).

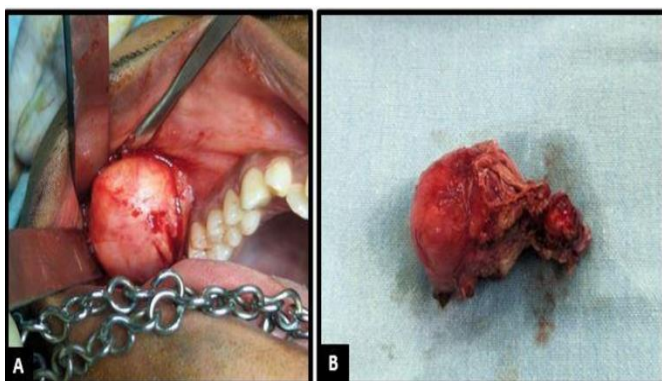


Figure 6. Intraoperative photograph (a&b) showing excisional biopsy of the tumor.

The excised specimen was well-circumscribed and firm in consistency. Postoperative recovery was uneventful, and satisfactory healing was observed during follow-up (Figure 7).



Figure 7. Postoperative clinical photograph demonstrating satisfactory healing at the surgical site with no evidence of recurrence or complications during follow-up.

Histopathological examination of the excised specimen revealed a grayish-white lesion with a whorled appearance on cut section. Microscopically, the lesion was well-circumscribed and composed of hypercellular, vaguely intersecting bundles of collagen fibers admixed with spindle-shaped fibroblasts. The cells exhibited uniform morphology without nuclear atypia, mitotic figures, or necrosis. Based on these findings, a diagnosis of benign spindle cell tumor consistent with spindle cell fibroma was established.

DISCUSSION

Spindle cells are derived from mesenchymal tissue and constitute an important component of the body's connective tissue. Cytologically, they appear elongated with fusiform or ovoid nuclei. The tissue of origin can be identified by the presence of stromal components such as collagen, cartilage, bone, fat, or myxoid material produced by tumor cells. In the present case, histopathological examination revealed vague intersecting bundles of collagen admixed with fibroblasts. The process of epithelial–mesenchymal transition (EMT), along with reduced expression of cell adhesion molecules such as cadherins, plays a key role in the underlying pathogenesis of spindle cell neoplasms^{3,5,6}.

Soft tissue spindle cell neoplasms rarely occur in the oral cavity and represent less than 1% of all oral tumors and approximately 3% of salivary gland neoplasms⁷.

A review of the literature by Jordan and Regezi, analyzing 307 cases of spindle cell neoplasms reported

between 1982 and 2002, demonstrated that among malignant tumors, Kaposi sarcoma was the most frequently observed entity, while other malignancies were relatively uncommon. Most benign lesions were of neural origin. The increased reporting of lesions such as myofibroma likely reflects improved awareness and the important role of immunohistochemistry in achieving accurate diagnosis⁷. In the present case, the lesion showed benign features, and immunohistochemistry was not performed, as a definitive diagnosis was established based on radiological and histopathological findings.

A review by Singh et al. (2018) presented spindle cell tumors of the head and neck region in a tabulated form, highlighting their diagnostic features, pathogenesis, histopathological characteristics, and prognosis³. The histopathogenetic features described in that review were consistent with those observed in the present case, supporting a benign non-recurring clinical course. Therefore, surgical excision was considered an appropriate treatment approach.

Because spindle cell lesions can closely mimic both benign and malignant conditions, inaccurate classification may lead to suboptimal patient management^{3,8}. Identifying the tissue of origin is crucial for assessing the biological behavior of the lesion⁹. Therefore, adjunct diagnostic techniques such as immunohistochemistry (IHC) and molecular pathology are of significant value³. In a systematic review by Surbhi et al., immunohistochemical markers for spindle cell lesions were summarized in a tabular format². Immunohistochemistry assists in clarifying histogenesis and improving differential diagnosis, while molecular pathology provides insight into tumor behavior and contributes to future therapeutic research³. Electron microscopy also plays a supportive role in evaluating soft tissue tumors^{3,10}.

Immunohistochemistry may be particularly useful in cases where there is no clear distinction between benign and malignant lesions. However, the affordability and availability of such diagnostic tests also influence their clinical application.

Although accurate diagnosis is essential, biopsy of certain soft tissue lesions in the oral cavity can be challenging due to complex anatomy, small lesion size, and proximity to vital structures such as nerves, blood vessels, tooth roots, and salivary gland ducts. This increases the risk of iatrogenic injury, particularly in high-risk anatomical sites, and may necessitate more conservative diagnostic approaches. Radiation-free imaging modalities with excellent soft tissue contrast provide a valuable alternative. Recent advances in dental MRI, particularly the use of black-bone sequences such

as STIR and DESS, allow detailed visualization of both hard and soft tissues in the oral and maxillofacial region. These imaging techniques improve preoperative assessment and contribute to precise surgical planning¹¹. In the present case, MRI findings suggested a benign fibroma, whereas histopathological examination confirmed spindle cell fibroma.

T. C. Schirmang described the use of percutaneous cryoablation in the management of a solitary fibrous tumor of the buccal space in a patient who refused surgical excision. The procedure utilized an argon-based cryoablation system with 1.7 mm diameter percutaneous applicators and a 3 cm active tip, producing a freeze zone of approximately 3 cm in length and 2 cm in width. This minimally invasive technique offers several advantages, including absence of surgical scarring, shorter recovery time, and real-time visualization of tumor response during and immediately after treatment. Further studies are required to evaluate the potential role of cryoablation as an alternative to conventional surgical excision in the management of benign lesions¹².

CONCLUSION

In summary, spindle cell fibroma is a rare benign lesion of the oral cavity that may be easily mistaken for other spindle cell entities due to its overlapping clinical and radiological features. A well-defined, non-infiltrative soft tissue mass with characteristic MRI hypointensity strongly favors a benign fibrous lesion, even in uncommon anatomical locations such as the masseteric space. This report highlights a rare and clinically relevant case supported by multimodal imaging, definitive histopathological diagnosis, and successful surgical management with an excellent outcome. The case emphasizes the importance of a comprehensive diagnostic approach and contributes to increased awareness among clinicians and pathologists regarding the occurrence, differential diagnosis, and management of spindle cell lesions in the oral cavity.

DECLARATION

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This research did not receive funding from any agency or institution.

Conflict of Interest

None to declare.

Ethical Approval

“Not applicable”

Consent for publication

“Not applicable”

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