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Case Report

Intra-oral intramuscular lipoma in a child masquerading as plunging ranula diagnosed on cytology

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ABSTRACT

Intra-oral intramuscular lipomas are rare, especially in pediatric populations. Their clinical presentation may mimic more common cystic lesions such as plunging ranulas, often leading to diagnostic confusion. We reported a rare case of an intramuscular lipoma of the floor of the mouth in a child, initially suspected to be a plunging ranula due to its submandibular swelling and soft, fluctuant consistency. Fine needle aspiration cytology (FNAC) revealed mature adipocytes without cystic or inflammatory elements, confirming the diagnosis of intramuscular lipoma. Surgical excision was performed, and histopathology corroborated the cytological findings. This case highlights the diagnostic challenge posed by intramuscular lipomas in the oral cavity of children and underscores the critical role of FNAC in distinguishing them from more common cystic lesions like plunging ranulas. Early and accurate diagnosis is essential to guide appropriate surgical management and prevent recurrence.

Keywords: Lipoma, Intraoral, Intramuscular, Ranula

INTRODUCTION

Intra-oral soft tissue masses in children present a diagnostic challenge due to their varied etiology and overlapping clinical presentations. Among the benign tumors affecting the oral cavity, lipomas constitute one of the most common mesenchymal neoplasms, though they are relatively uncommon in the pediatric population and even rarer when occurring in the oral cavity.[1,2] Lipomas in the oral cavity are particularly unusual, as most tend to develop on the trunk and proximal portions of the extremities.[3] Intramuscular lipomas represent a distinct subset of adipocytic tumors that infiltrate between muscle fibers and can present diagnostic challenges both clinically and cytologically. Only three cases of infiltrating lipomas have been reported in children to date, highlighting the rarity of these lesions in the pediatric age group. The intraoral location further compounds the diagnostic complexity, as lipogenic tumors are an uncommon entity in children.[4,5]

Plunging ranula, in contrast, represents a relatively more common salivary gland pathology in children. Plunging ranula occurs when extravasation of mucus occurs beyond the confines of the floor of mouth through mylohyoid muscle into the upper neck or submental region.[6] The clinical presentation of plunging ranula can closely mimic other soft tissue masses, making accurate preoperative diagnosis crucial for appropriate surgical planning. Fine needle aspiration cytology (FNAC) has emerged as a valuable diagnostic tool in differentiating these lesions. Fine needle aspiration cytology can be used as the routine method to reach a diagnosis for plunging ranula, especially in the absence of floor of mouth involvement.[7,8] For plunging ranula, aspiration cytology will show mucin with muciphages and biochemical analysis will show increase in amylase and protein content.[9] Conversely, clues to

diagnosis of lipoma on cytology include mature fat, bland spindle cells, a myxoid background and mast cells.[10, 11] The differential diagnosis between intramuscular lipoma and plunging ranula is particularly challenging when the lesion presents in an unusual location or in an uncommon age group. The diagnostic efficacy of FNA of spindle cell lipoma based on its FNAC findings is a challenge, especially when considering the various differential diagnoses that may arise.[10,11]

We reported a rare case of an intraoral intramuscular lipoma in a pediatric patient that initially masqueraded as a plunging ranula, emphasizing the importance of cytological examination in establishing the correct diagnosis and guiding appropriate treatment strategies.

CASE REPORT

We reported a case of 8-year-old female who presented with the complaint of painless and slowly enlarging swelling in the floor of the mouth, initially suspected to be a either mucocele/ irritational fibroma/ plunging ranula for past 4 months. On examination, well defined mass measuring approximately 3×3 cm was identified which was soft and non-tender (Figure 1). Thus, provisional diagnosis of plunging ranula was made initially which was extending to submental and submandibular region.

Figure 1: (A) Frontal view of the child's face; (B) intra-oral view showing the underside of the tongue.

Radiology (MRI) was done which showed a well circumscribed encapsulated ovoid shaped T1/T2 hyperintense lesion approx. 3.2×1.9×3 cm seen in right sublingual space (Figure 2). Fine needle aspiration cytology from the swelling in floor of mouth showed mature fibroadipose tissue fragments against a lipidaceous background. Few areas display scattered collagen and fibromuscular fragments. Thus, diagnosis of benign spindle cell lipomatous lesion was made (Figure 3).

In view of clinico-cytological disparity, excision was planned. Gross examination showed well circumscribed 3×3×2.5 cm mass which was yellowish-tan on cut section having few greyish areas in the centre. Histopathological finding from right sublingual swelling showed a well circumscribed tumor composed of lobules of mature adipocytes separated by thin fibrovascular septae. Intervening areas displayed fascicles of skeletal muscle bundles. Thus, a final diagnosis of intramuscular lipoma was therefore rendered (Figure 3). The definitive treatment for the intraoral intramuscular lipoma involved complete surgical excision through an intraoral approach to avoid external scarring and preserve facial aesthetics (Figure 4). Dissection was performed to ensure complete removal of the lesion along with involved muscle fibers, while carefully preserving adjacent vital structures such as the lingual nerve and submandibular duct. Post-operatively, the patient was closely monitored for complications including bleeding, infection, and nerve injury, and appropriate analgesia and oral hygiene measures were implemented.

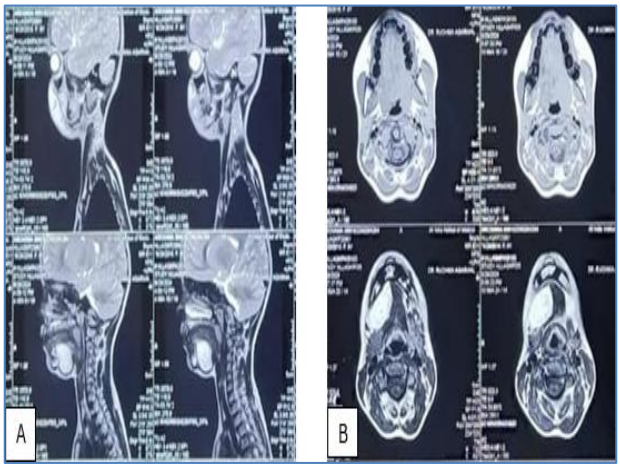

Figure 2: (A) Series of sagittal MRI scans of the head and neck; (B) series of axial MRI scans of the head and neck.

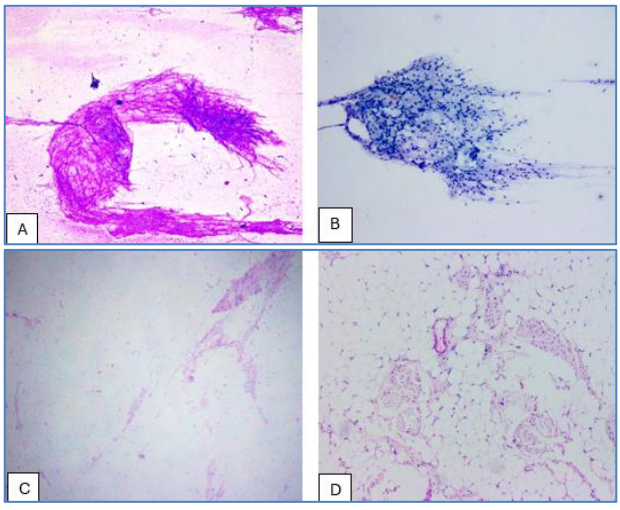

Figure 3: (A) Cytology FNAC (MGG×40) shows fibro-adipose fragments; (B) cytology FNAC (pap×100) depicting scattered spindle cells in fibroadipocytic fragment along with fibrous strands; (C) H and E, 10X view showing lobules of adipocytes with intervening septae; and (D) H and E, 40X view dispersed as well aggregates of fibromuscular bundles in it.

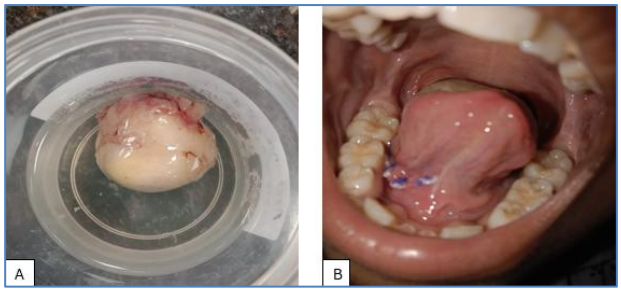

Figure 4: (A) Image shows grossly well circumscribed smooth yellowish mass; and (B) post-operative examination showed closure of the incision margin.

Follow-up was scheduled at regular intervals- initially at three and six months post-surgery, followed by annual reviews for at least two years- to detect any signs of recurrence, which is a recognized risk due to the lesion's intramuscular infiltration. Functional assessment of the oral musculature was conducted during follow-up visits to ensure no impairment in speech or swallowing, with rehabilitative therapies planned as needed. The patient showed excellent recovery without recurrence or functional deficit during the follow-up period.

DISCUSSION

This case represents a diagnostically challenging presentation of an exceptionally rare entity - intraoral intramuscular lipoma in a pediatric patient. The rarity of this condition, combined with its atypical clinical presentation mimicking a plunging ranula or mucocele, underscores several important clinical and diagnostic considerations that warrant detailed discussion. The clinical presentation of our case exemplifies the diagnostic pitfalls associated with soft tissue masses in the floor of the mouth. The soft, fluctuant consistency and submandibular extension closely resembled the characteristic features of a plunging ranula, which represents one of the most common salivary gland disorders in children.[12] Plunging ranulas typically present as painless, soft masses that extend from the sublingual space through the mylohyoid muscle into the submandibular space, creating a bilobed appearance on imaging studies.

The age of presentation further supported the initial clinical suspicion of plunging ranula, as this condition shows a bimodal distribution with peaks in childhood and young adulthood.[13] Additionally, the absence of typical lipomatous characteristics such as the classic "slip sign" or obvious fatty consistency on palpation contributed to the diagnostic uncertainty. Intramuscular lipomas often lack the characteristic mobility and soft consistency of their superficial counterparts due to their infiltrative nature and deep tissue location.[14] While imaging studies may provide valuable anatomical information, cytological examination offers definitive tissue characterization that is crucial for accurate diagnosis. The cytological features that distinguish lipomatous lesions from cystic pathologies are well-established: mature adipocytes with peripheral nuclei, minimal cellular atypia, and absence of mucin or inflammatory debris.[15]

In contrast, plunging ranula cytology typically reveals thick, viscous mucoid material containing muciphages, epithelial cells, and inflammatory elements. The biochemical analysis of aspirated fluid can provide additional diagnostic confirmation.[16] The safety profile and diagnostic accuracy of FNAC in pediatric patients make it an invaluable tool for preoperative planning. Studies have demonstrated high sensitivity and specificity rates for FNAC in differentiating benign from malignant lesions in children, with minimal associated morbidity.[17] Intramuscular lipomas demonstrate infiltrative growth patterns that can make complete excision technically demanding, particularly in the confined space of the floor of the mouth. The intimate relationship with surrounding muscle fibers necessitates careful dissection to achieve complete removal while preserving functional tissues. The risk of recurrence in incompletely excised intramuscular lipomas is well-documented, with rates ranging from 3-5% in various anatomical locations. Thus, this case highlights the importance of maintaining a broad differential diagnosis when evaluating soft tissue masses in children, even when the clinical presentation strongly suggests a common pathology. Second, it emphasizes the role of tissue sampling in establishing definitive diagnoses. Thus, standardized diagnostic algorithms must be developed that incorporate clinical, radiological, and cytological findings to improve diagnostic accuracy and treatment.

CONCLUSION

This case highlights the importance of maintaining a broad differential diagnosis when evaluating intraoral swellings in children and the critical role of cytology in distinguishing soft tissue tumors from cystic or salivary gland lesions. Early and accurate diagnosis ensures appropriate surgical planning and reduces the likelihood of recurrence or complications.

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