REVIEW ARTICLE

Osteolipoma of head and neck – a review

Billy L.K. Wong, Christopher Hogan

Mid and South Essex NHS Foundation Trust, Broomfield Hospital, Department of Otolaryngology, Chelmsford, Essex, CM1 7ET, United Kingdom

Received 3 January 2022; accepted 25 April 2022
Available online 20 May 2022

HIGHLIGHTS

- 80% of the patients with osteolipoma presented with a painless mass which had pre-existed for at least 4-months contrary to a lump associated with a malignant process.
- Histology consisting of variable mixture of adipose tissue interspersed with lamellar bone, woven bone, cancellous bone, compact bone and osteoblasts is key to confirm the diagnosis of osteolipoma.
- Osteolipoma should not be confused with other benign tumours with bony element including parosteal lipomas and intraosseous lipomas.
- Recognising osteolipoma early is important for patient reassurance as well as avoiding unnecessary radical treatment.

KEYWORDS

Osteolipoma; Head and neck; Radiology; Histopathology

Abstract

Objective: Due to the rarity of osteolipoma, current knowledge and understanding of its' clinical presentation, management, radiological features, histological characteristics, and prognosis are lacking and can present a clinical conundrum to clinicians and histopathologist alike, given wide range of differential diagnoses. This paper aims to compile, analyse and present details to augment the available literature on osteolipoma in the head and neck.

Methods: A comprehensive literature search on PUBMED/MEDLINE, EMBASE, CINAHL and Science Citation Index, Google scholar and Cochrane database for osteolipoma in head and neck was performed up to the 1st May 2021. Reference lists from the relevant articles were then inspected and cross-referenced and any other pertinent publications were added to the review.

Results: A total of 38 cases were identified from the literature. The commonest sites of involvement within the head and neck region were the oral cavity in 21 (56.8%) patients, followed by the neck in 7 (19.0%) patients. 29 (78.4%) patients presented with soft tissue swelling or mass making it the most common presenting feature. All patients had the tumour excised surgically; of which 18 (48.6%) were excised via transoral approach and 6 (16.2%) via open transcervical approach including 1 lateral pharyngotomy. 12 papers documented long-term follow-ups (median 12 months) with no recurrence. Only 1 regrowth was reported after 5-years.

* Corresponding author.
E-mail: bwonglk@doctors.org.uk (B.L. Wong).

Peer Review under the responsibility of Associação Brasileira de Otorrinolaringologia e Cirurgia Cérvico-Facial.

https://doi.org/10.1016/j.bjorl.2022.04.002

1808-8694/© 2022 Associação Brasileira de Otorrinolaringologia e Cirurgia Cérvico-Facial. Published by Elsevier Editora Ltda. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).
Conclusions: Osteolipoma is a rare soft tissue neoplasm which has a wide range differential diagnosis including malignant processes. Recognising this benign tumour through an awareness of presenting sign and symptoms, radiological features and histopathology findings is important for patient reassurance as well as avoiding unnecessary radical treatment.

© 2022 Associação Brasileira de Otorrinolaringologia e Cirurgia Cervico-Facial. Published by Elsevier Editora Ltda. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

Introduction

Osteolipoma was first described by Plaut et al. in 1959. Over the years, it has been given different names including osseous lipoma, ossifying lipoma and lipoma with osseous metaplasia.

According to the World Health Organisation (WHO) classification of soft tissue tumours, osteolipoma is a variant of lipoma. It is an extremely rare variant, accounting for less than one percent of all lipomas found in the human body.

It is even rarer within the head and neck region, with only 37 cases described in the English literature. Owing to the rarity, comprehensive details about its clinical presentation, management, radiological features, histological characteristics and prognosis are lacking and presents a clinical conundrum to clinicians.

In this review, we aim to examine the cases in the literature and present a complete updated review on this rare tumour.

Methods

A comprehensive literature search on PUBMED/MEDLINE, EMBASE, CINAHL and Science Citation Index, Google scholar and Cochrane database for osteolipoma in head and neck was performed up to the 1st May 2021. Key words used were osteolipoma, ossifying lipoma, ossified lipoma, lipoma with osseous metaplasia and head and neck. The search was further extended MeSH words like oropharynx; tonsil; tongue; palate; larynx; pharynx; hypopharynx; pyriform fossa; postcricoid region; lateral pharyngeal wall; neck; parotid; submandibular; oral cavity; external auditory canal; internal auditory canal; temporal bone; paranasal sinus; tongue; and mandible. All articles including non-English papers were considered, and if included, non-English papers were translated.

Publications on osteolipoma arising only from the head and neck sub-sites were included. Reference lists from the relevant articles were then inspected and cross-referenced and any other pertinent publications were added to the review. Detailed search strategy is shown in Fig. 1.

Results

A total of 38 cases were identified and included from the literature (Table 1). All the papers were in English, except one (Turkish). There were 19 (50%) females and 19 (50%) males. The patients’ age ranged from 6-years to 81-years, with a median age of 51. Three quarters of the patients were between 30 and 70-years of age. Only one paediatric case was ever reported.

The commonest sites of involvement within the head and neck region was the oral cavity in 21 (56.8%) patients, followed by the neck in 7 (19.0%) patients. Other reported sites included the salivary gland, paranasal sinuses, nasopharynx, pharynx, orbit, and tymanomastoid region. The smallest recorded lesion was 8-mm in size within the tongue and the largest lesion measured 7 × 6 cm on the floor of mouth.

30 (78.4%) patients presented with soft tissue swelling or mass making it the most common presenting feature. Other common presenting features include dysphagia (5.4%), paraesthesia in the trigeminal distribution (5.4%), nasal obstruction (5.4%) and middle ear effusion (5.4%).

All patients had the tumour excised surgically; of which 18 (48.6%) were excised via transoral approach and 6 (16.2%) via open transcervical approach including 1 lateral pharyn-
Table 1  Cases from the literature.

| Author  | Site            | Subsite                  | Gender | Age | Duration | Presentation      | Imaging   | Size                  | Treatment                                      | Outcome                                 |
|---------|-----------------|--------------------------|--------|-----|----------|-------------------|-----------|-----------------------|-----------------------------------------------|------------------------------------------|
| Abdalla | Paranasal sinus | Frontoethmoidal sinus    | M      | 66  | ND       | Nasal obstruction | CT        | ND                    | Endoscopic anterior ethmoidectomy and partial excision left middle meatus bony mass | Regrowth – further debulking          |
| Aboh    | Neck            | Submandibular area       | M      | 33  | ND       | Painless mass     | MRI, CT   | ND                    | Transcervical excision                        | ND                                       |
| Adebiyi | Oral cavity     | Hard palate              | F      | 37  | 10 years | Painless mass     | CT, MRI   | 3.2 × 1.6 cm          | Transoral excision                           | ND                                       |
| Allard  | Oral cavity     | Mandibular buccal sulcus | F      | 81  | 30 years | Painless mass     | Radiograph | 3.5 × 2 cm   | Transoral excision                        | ND                                       |
| Amaral  | Oral cavity     | Buccal mucosa            | M      | 51  | 3 years  | Painless mass     | US, radiography | 2.0 × 1.5 cm | Transoral excision                        | No recurrence after 12 months             |
| Arantes | Neck            | Mandibular area          | F      | 60  | 5 years  | Painless mass     | OPG, CT   | 2.6 × 1.6 × 0.9 cm    | Transoral excision                        | No recurrence after 12 months             |
| Bajpai  | Oral cavity     | Hard palate              | M      | 55  | 4 years  | Painless mass     | CT        | 1.5 × 1 cm            | Transoral excision                        | ND                                       |
| Battaglia | Salivary gland | Parotid gland            | M      | 56  | 15 years | Painless mass     | CT, MRI   | 4.3 × 3.7 × 6 cm      | Parotidectomy                                | ND                                       |
| Blanshard | Pharynx       | Retropharynx             | M      | 40  | 4 months | Painless mass     | Radiograph, CT | 3 cm          | Lateral pharyngotomy approach               | ND                                       |
| Author | Site | Subsite | Gender | Age | Duration | Presentation | Imaging | Size | Treatment | Outcome |
|--------|------|---------|--------|-----|----------|--------------|---------|------|-----------|---------|
| Bowers | 14   | Pharynx | Retropharynx | M   | 81       | Dysphagia, weight loss | MRI, CT | 2 × 4 cm | Transcervical excision | ND |
| Bulkeley | 15  | Neck | Parapharyngeal space | M | 68 | Jaw pain, numbness in V1 distribution | MRI, CT | 4 × 1.5 cm | Transcervical excision | ND |
| Castilho | 16  | Oral cavity | Buccal mucosa | F | 65 | Painless mass | NA | 1 × 1 cm | Transoral excision | ND |
| Decastro | 17  | Oral cavity | Buccal mucosa | F | 47 | Facial mass | NA | 0.8 cm | Excision of lesion | ND |
| Diom    | 18   | Salivary gland | Parotid gland | F | 21 | Painless mass | NA | 5 cm | Parotidectomy | No recurrence after 26 months |
| Dougherty | 19  | Oral cavity | Gingivolabial sulcus | F | 30 | Facial mass | CT | 4 × 2.5 cm | Transoral excision | ND |
| Durmaz  | 19   | Nasopharynx | Nasopharynx | M | 21 | Aural fullness, nasal obstruction | CT, MRI | 3 × 2 cm | Transnasal endoscopic and transpalatal approach | No recurrence after 6 months |
| Firth   | 20   | Oral cavity | Buccal mucosa | F | 56 | Painless mass | CT | 1.8 × 1.2 × 0.8 cm | Excision of lesion | ND |
| Fukushima | 21  | Face | Zygomatic arch/coronoid process | M | 28 | Trismus, nasal mass | CT, MRI | 6.6 × 4.5 × 2.1 cm | Intra and extra oral excision | No recurrence after 24 months |
| Godby   | 22   | Oral cavity | Floor of mouth | M | 54 | Painless mass | Radiograph | 7 × 6 × 3 cm | Transoral excision | ND |
| Gokul   | 23   | Oral cavity | Hard palate | M | 6 | Nasal regurgitation, recurrent OME | CT | 3 × 2 cm | Transoral excision | ND |
| Author          | Site              | Subsite                  | Gender | Age | Duration | Presentation                  | Imaging               | Size                | Treatment                          | Outcome                        |
|-----------------|-------------------|--------------------------|--------|-----|----------|--------------------------------|-----------------------|---------------------|------------------------------------|--------------------------------|
| Hazarika        | Neck              | Parapharyngeal space     | F      | 17  | 1 year   | Facial mass, lump in throat    | CT                   | 5 × 4 cm            | Mandibulotomy and transcervical excision | No recurrence after 1 month    |
| Hsu             | Oral cavity       | Buccal mucosa            | M      | 71  | 4 years  | Painless mass                  | NA                   | 3.8 × 2.4 × 1.3 cm   | Excision of lesion               | No recurrence after 12 months  |
| Hughes          | Oral cavity       | Mandibular buccal vestibule | M    | 69  | ND       | Painless mass                  | OPG                  | 3.5 × 2.6 × 1.7 cm   | Transoral excision               | ND                             |
| Cakir Karabas   | Oral cavity       | Mandibular buccal vestibule | M    | 53  | ND       | Painless mass                  | Radiograph, CBCT     | 2 × 15 × 1 cm        | Excision of lesion               | ND                             |
| Kavusi          | Neck              | Submandibular area       | M      | 67  | 10 years | Painless mass                  | CT                   | 3.5 × 2 cm           | Transcervical excision            | ND                             |
| Kumar           | Eye               | Eyelid                   | F      | 50  | 5 years  | Nodular swelling               | NA                   | 2 × 1.5 × 1 cm       | Excision of lesion               | ND                             |
| Minutoli        | Neck              | Parapharyngeal space     | F      | 46  | ND       | Dysphagia, paraesthesia V3, OME | CT, MRI              | 2.5 × 4 cm          | Transcervical excision            | ND                             |
| Ohno            | Neck              | Parapharyngeal space     | F      | 58  | 1 year   | Throat and neck mass           | CT, MRI, 99mTc Ga     | 9 × 4 cm            | Transcervical and transoral approach | ND                             |
| Omonte          | Oral cavity       | Buccal mucosa            | F      | 29  | 8 months | Painless mass                  | Radiograph           | 1.8 × 1.5 × 1.2 cm   | Transoral excision               | No recurrence after 5 years    |
| Author | Site | Subsite | Gender | Age | Duration | Presentation | Imaging | Size | Treatment | Outcome |
|--------|------|---------|--------|-----|----------|-------------|---------|------|-----------|---------|
| Piattelli | Oral cavity | Tongue | F | 49 | 8 years | Painless mass | NA | 0.8 cm | Transoral excision | No recurrence after 4 years |
| Raghunath | Oral cavity | Floor of mouth | F | 20 | 3 years | Painless mass | CT | 6 × 6 cm | Transoral excision | ND |
| Ramadass | Mastoid | Mastoid | M | 45 | 18 years | Painless mass | CT | 3 × 4 cm | Excision of lesion – post auricular approach | ND |
| Rovira | Oral cavity | Buccal mucosa | F | 38 | 10 years | Painless mass | OPG | 2 × 2 × 3 cm | Transoral excision | ND |
| Saghafi | Oral cavity | Mandibular Alveolar mucosa | M | 68 | 4 years | Painless mass | Radiograph | 1.5 × 1 cm | Transoral excision | No recurrence after 12 months |
| Seelam | Oral cavity | Retromolar region | F | 55 | 6 years | Painless mass | US, OPG | 3 × 2 cm | Transoral excision | ND |
| Shabbir | Oral cavity | Labial sulcus | F | 58 | 1 year | Painless mass | OPG | 2 × 2 cm | Transoral excision | ND |
| Sharma | Oral cavity | Hard palate | M | 35 | 8 years | Painless mass | CT | 4 × 2.7 × 0.8 cm | Transoral excision | No recurrence after 36 months |
| Turkoz | Mastoid | Mastoid | F | 34 | 6 years | Painless mass | US | 3 × 2.5 × 1.5 | Excision of lesion | No recurrence after 12 months |

F, Female; M, Male; CT, Computed Tomography; CBCT, Cone Beam CT; MRI, Magnetic Resonance Imaging; US, Ultrasound; OPG, Orthopantomogram; ND, Not Described.
gotomy. Other patients required combined transoral and transcervical approaches (5.4%), parotidectomies (5.4%) and transnasal endoscopic approach (5.4%) respectively.

13 papers documented follow-up ranging from 1-month to 5-years (median 12-months) with no recurrence. Only 1 regrowth was reported after 5-years.

Discussion

Terminology

The terminologies used for adipocytic tumour/lipoma with osseous component can be confusing. Terms such as ossifying lipoma, osseous lipoma, and lipoma with osseous metaplasia have been used interchangeably with osteolipoma. Consequently, many prior reports of ”osteolipoma” included tumours which in actual fact are parosteal lipomas and intraosseous lipomas.28,31,32,41

Parosteal lipomas are neoplasms of mature adipose tissues that are contiguous with underlying periosteal bones, commonly associated with reactive changes or hyperostosis in the underlying cortex whereas intraosseous lipomas are lipomas that arises within the medullary cavity and occasionally within the cortex of a bone.15,16,28,31,35,41

Hence, ”true” osteolipomas, based on the current review are adipocytic neoplasms with osseous tissue which are independent or not attached to any bone.

Osteolipoma however, can be classified according to the composition of its tissue content. It is called ossifying lipoma if the adipose component is the predominant tissue type, while the term osteolipoma is used if it contains more bony element.42

Epidemiology

Osteolipoma is rare and only featured in case series and case reports to date. Its’ precise incidence is therefore unknown. However, it is thought to account for less than 1% of all lipoma cases.28,43

It has near-equal gender ratio and is pre-dominantly found in adulthood. Gokul et al. reported a congenital case in a patient aged 6, of the hard palate. It remains the only paediatric case reported in the literature to date.23

Presentation

Classically, osteolipoma and majority of the head and neck osteolipoma presents as a painless swelling or mass located in the submucosa or soft tissue (Fig. 2). The texture or consistency of the mass itself is variable ranging from soft and fluctuant to firm and hard.13,38 The surface of the mass can be smooth or nodular with no overlying skin or mucosal changes.4

Additionally, when arising from the head and neck region, the signs and symptoms can be variable depending on the site of origin and size of the tumor. Lesions arising from the nasopharynx and paranasal sinuses tend to present with nasal obstruction.5,19 Large tumor located in pharynx or parapharyngeal space can present with pressure symptoms on the surrounding structures, resulting in dysphagia, pain and altered voice.

Figure 2 A clinical photograph on an osteolipoma of the hard palate in the oral cavity.

Figure 3 A coronal CT scan of the patient in Fig. 2 showing a hypodense mass (fat attenuation centrally) with peripheral hyperattenuation (calcification).

paraesthesia in the trigeminal nerve distribution and middle ear effusion.14,15,30

The child with the congenital osteolipoma of the palate presented with a cleft palate, nasal regurgitation and recurrent middle ear infections.23

Diagnostic imaging

Given the wide range differential diagnoses of soft tissue tumours, characteristic radiological features are vital in aiding the diagnosis of osteolipoma, as well as assessing the exact site, delineate the extent of disease and help decide treatment approaches.

Computed Tomography (CT) with or without contrast is the most frequently used cross-sectional imaging to investigate osteolipoma. Radiologically, it is a well-defined, heterogenous mass with mixed density.2,18 Its overall appearance is dependent on the predominant make-up of the tumour. Tumours which are clinically soft and consist of mainly fatty tissue appear as hypodense mass (fat attenuation centrally) with peripheral hyperattenuation (calcification) (Fig. 3).14,40 Internal septations can occasionally be observed.75,40 Conversely, tumours which are clinically firm and hard would appear as a hyperdense...
mass with central calcified portion and focal areas of fat attenuation.\textsuperscript{1,10}

More importantly, osteolipoma does not erode into the underlying bone, nor does it invade into the surrounding structures which would suggest a more aggressive and sinister disease process.\textsuperscript{2,40} It is also not known to cause periosteal reaction or hyperostosis of the adjacent bone. However, it can displace adjacent structures and cause thinning and bowing of the adjacent bones.\textsuperscript{15,21,24,30}

Although Magnetic Resonance Imaging (MRI) is the imaging modality of choice to characterize soft tissue neoplasm, it was only utilized in 7-cases, most likely due to limited availability. On MRI, osteolipoma is a well circumscribed tumour with high signal intensity on T1 (Fig. 4) and Short Tau Inversion Recovery (STIR) sequences. It has a suppressed signal intensity on Diffusion-Weighted magnetic resonance imaging (DWI) sequences and fat-suppressed images. Hence, it is important to obtain images with fat suppression to differentiate fatty tissue from other soft tissues on magnetic resonance imaging.\textsuperscript{15,18,19} It can, however, appear either as a hyperintense or hypointense lesion on T2-weighted images depending on its' core component. The lining of the tumour is often hypointense on both T1 and T2 images due to the osseous layer or fibrous tissue circumscribing the lesion.\textsuperscript{12,19,30,40}

Occlusal radiograph or orthopantomography is useful as first line investigation for tumour arising within the oral cavity. Typically, oosteolipoma would appear as a well-defined radiopaque mass with an irregular pattern of trabeculae or occasional flecks of calcification within. Given the nature of soft tissue tumour, no cortical abnormality should be found.\textsuperscript{5,31,39}

Ultrasonography was only used in a handful of cases. It would characterize the lesion as hyperechoic with focal areas of calcification.\textsuperscript{9,18}

\textbf{Histopathology}

Histologically, osteolipoma consists of mature adipose tissue interspersed with multi-focal areas of bony tissue.\textsuperscript{24,29} It contains a variable mixture of adipose tissue, lamellar bone, woven bone, cancellous bone, compact bone and osteoblasts.\textsuperscript{7} The lobules of adipose tissue are separated by thin fibrous connective tissue septa.\textsuperscript{10,17,32}

Microscopically, the adipocytes are regular in size and shape, and the nuclei are uniform with no hyperchromasia.\textsuperscript{12} The bony tissue can be mature or immature. The more mature lamellar bone exhibits Haversian canal formation and central fatty marrow which lacks hematopoietic cells.\textsuperscript{14,24} On the other hand, irregular trabeculae of woven bone are surrounded by proliferating osteoblasts and active collagenisation.\textsuperscript{24,29} Some of the mature bony tissues were also lined with osteoblasts.\textsuperscript{21}

No nuclear atypia, cellular pleomorphism, mitosis or necrosis was ever reported in any of the cases.

\textbf{Pathogenesis}

The pathogenesis of osteolipoma is still unclear. Several hypotheses have been proposed to explain its' pathogenesis.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure4.png}
\caption{An axial MRI of another patient (histologically confirmed osteolipoma) showing a well circumscribed tumour with high signal intensity on T1.}
\end{figure}

It is thought that osteolipomas may arise from the proliferation of mesenchymal stem cells (characterizing a "mesenchymoma"), either directly from multipotent stem cells, or cells from a different lineage which subsequently differentiates into lipoblasts, chondroblasts or osteoblasts, and fibroblasts.\textsuperscript{8,17,20,27} This adip-o-osteogenic differentiation of mesenchymal stem cells is finely balanced by a variety of external factors including chemical, physical, and biological factors.\textsuperscript{34}

Another hypothesis is that osteolipoma forms from fibroblast metaplasia within a pre-existing lipoma, which is usually large and long-standing.\textsuperscript{16,31} The metaplasia occurs due to repetitive trauma which leads to subsequent metabolic changes, ischemia and calcium deposition.\textsuperscript{2,27} Fritchie et al. was in support of this theory as cyto genetic analyses from their case series showed chromosomal translocations which are consistent with the karyotypic features of simple lipoma.\textsuperscript{42} Arantes et al. also indicated that the presence of osseous of trabeculae along the fibrous septi further supported this hypothesis.\textsuperscript{10}

Other alternative hypothesis includes the transformation of fibroblasts into osteoblasts induced by growth factors released from monocytes or due to the ossification of an inadequately nutritional supplied tissue within the core the lipoma.\textsuperscript{15,27,31}

\textbf{Differentials}

The differential diagnoses for a well-defined, extraosseous soft-tissue mass containing both adipose and osseous components is dependent on the location of the lesion. Nonetheless, the differential diagnoses are wide and includes both benign and malignant processes as outlined in Table 2.

In the paranasal sinuses, the differential diagnosis includes inverted papilloma due to its’ appearance on endoscopy. However, the lack of adjacent inflammatory
mucosa on CT is unusual for this entity. Instead, the ground-glass appearance of the lesion on CT suggests that fibrous dysplasia should be considered as a differential diagnosis.5

One of the main differential diagnoses of osteolipoma within the oral cavity is osteocartilaginous choristoma. It has a marked predilection for the tongue, but diagnosis can only be confirmed through histopathology. In contrast to osteolipoma, the histology of osteocartilaginous choristoma shows mass of dense lamellar bone with Haversian canals and haematopoietic marrow which is absent in osteolipoma.27

Other differential diagnoses within the oral cavity include dermoid cyst, teratoma, myositis ossificans and liposarcoma. Dermoid cyst and teratoma tend to be more heterogenous and cystic on CT. Myositis ossificans has a typical appearance on CT – a well circumscribed intramuscular lesion with a distinct zonating/ossification pattern which progresses from an immature, central, non-ossified cellular focus, to osteoid, and then to a peripheral rim of mature bone over days to weeks. It is separated from the underlying bone by a radiolucent zone. In the head and neck, MO is often found in the pterygoid muscles but can be seen in the masseter, temporalis, buccinators, sternocleidomastoid, and platysma.1,45,46

Osteolipoma can mimic or be difficult to differentiate from well-differentiated liposarcoma based on imaging alone. However, features such as thickened or nodular septi (>2 mm thick), prominent foci of high T2 signal and prominent areas of enhancement are suspicious for liposarcoma.47

Management

As a benign, indolent and slow growing neoplasm, osteolipoma can potentially be managed conservatively. Majority of the lesions reported were long-standing, with duration since detection ranging from 4-months to 30-years (median = 4-years). However, most of these patients presented due to the enlarging lesion or symptoms secondary to the compressive or obstructive effect requiring surgical intervention.

The only treatment of choice is therefore a complete surgical excision. The surgical approach differs based on the location of the osteolipoma. 17 of the 21 cases of the oral cavity lesions were excised successfully via a transoral approach. The remaining 4 cases did not describe their approaches.

Parotid salivary gland lesions were managed using a parotidectomy approach. Diom performed a total parotidectomy as the lesion was located between the deep lobe of parotid gland and the parapharyngeal space.18 The integrity of the facial nerve was not mentioned. Battaglia performed a superficial parotidectomy as the lesion was entirely within the superficial lobe.12 The facial nerve was fully preserved.

Endoscopic approaches were used for lesions within the paranasal sinuses and nasopharynx. Durmaz employed a combination of transnasal and transpalatal approach to excise the lesion attached to the posterior surface of nasal septum and posterior wall of nasopharynx. Most osteolipoma within the neck were excised using a transcervical approach. One lesion within the parapharyngeal space extending into the infratemporal fossa required a mandibulotomy.21 Blanshard performed a lateral pharyngotomy to access an osteolipoma in the retropharynx.16

### Table 2: Differential diagnoses.

| Site            | Differential diagnoses                                                                 |
|-----------------|----------------------------------------------------------------------------------------|
| Nasopharynx     | Chondroblastoma, Osteochondroma, Calcified lipoma, Ossifying fibroma, Osteoma, Enchondroma |
| Paranasal sinus | Inverted papilloma, Fibrous dysplasia                                                   |
| Neck            | Submental triangle: Teratoma, Tumour calcinosis, Ossifying fibroma, Hemangioma, Myositis ossificans, Soft tissue sarcomas (liposarcoma, synovial sarcoma, osteosarcoma, chondrosarcoma) |
| Parotid gland (parotid) | Alveolar mucosa: Exostosis, Peripheral giant cell granuloma, Fibrous hyperplasia, Fibroma with calcifications, Buccal mucosa, Osteocartilaginous choristoma, Chondrolipoma, Pleomorphic adenoma with ossification, Mucocele, Benign minor salivary gland tumour, Tongue: Osteocartilaginous choristoma, Osteosarcoma, Liposarcoma with metaplasia, Post-traumatic chondrofication, Palate: Cementifying fibroma, Osteoma, Neurofibroma, Intrasosseous palatal cyst, Well differentiated liposarcomas, Floor of mouth: Teratoma, Dermoid cyst, Osteoma, Ossifying fibroma, Myositis ossificans, Osteocartilaginous choristoma, Metastatic chondrosarcoma, Osteosarcoma, Liposarcoma with metaplasia, Synovial sarcoma |
Prognosis

Osteolipoma has a particularly good prognosis similar to that of a conventional lipoma. Of the 12 cases which documented their long-term follow-ups, no recurrences were reported in the 11 lesions which were completed excised. No malignant transformation had been reported to date. Abdalla et al. reported a regrowth and not recurrence of the lesion 5-years after the initial surgery, where the mass was only partially excised due to the extension into frontal sinus.3

There is currently no consensus regarding the duration of follow-up for head and neck osteolipoma. In this review, the longest documented follow up was up to 5-years. Some authors suggested close monitoring and long-term follow-up given the paucity of knowledge about this rare entity.

Conclusion

Osteolipoma is a rare soft tissue neoplasm which has a wide range differential diagnosis including malignant processes. Recognising this benign tumour through an awareness of presenting sign and symptoms, radiological features and histopathology findings is important for patient reassurance as well as avoiding unnecessary radical treatment.

Conflicts of interest

The authors declare no have conflicts of interest.

Acknowledgement

The authors would like to thank Sonam Sharma and Vikas Dhillon for supplying Fig. 2 and Fig. 3. Source: (Osteolipoma: An Extremely Rare Hard Palate Tumor. Cureus 12(5):e8146. doi:10.7759/cureus.8146).

References

1. Plaut GS, Salm R, Trustcott DE. Three cases of ossifying lipoma. J Pathol Bacteriol. 1959;78:292–5.
2. Dougherty W, Shonka D, Mukherjee S. A painless right facial mass. Osteolipoma. JAMA Otolaryngol Head Neck Surg. 2015;141:485–6.
3. WHO Classification of Tumours Editorial Board. Soft Tissue and Bone Tumours, Volume 3, 5th edition WHO Classification of Tumours; 2020. ISBN: 9789283245025.
4. Allen PW. Tumors and Proliferations of Adipose Tissue. New York: Masson Publication USA; 1981.
5. Abdalla WM, Motta AC, Lin SY, McCarthy EF, Zinreich SJ. Intraosseous lipoma of the left frontoethmoidal sinuses and nasal cavity. AJNR Am J Neuroradiol. 2007;28:615–9.
6. Aboh IV, Chisci G, Salini C, Gennaro P, Cascino F, Gabriele G, et al. Submandibular ossifying lipoma. J Craniofac Surg. 2015;26:973–4.
7. Adebiyi KE, Ugboko VI, Maaji SM, Nduubizu G. Osteolipoma of the palate: report of a case and review of the literature. Niger J Clin Pract. 2011;14:242–4.
8. Allard RH, Blok P, van der Kwast WA, van der Waal I. Oral lipomas with osseous and chondroid metaplasia; report of two cases. J Oral Pathol. 1982;11:19–25.
9. Amaral MB, Borges CF, de Freitas JB, Capistrano HM, Mesquita RA. Osteolipoma of the oral cavity: a case report. J Maxillofac Oral Surg. 2015;14:195–9.
10. Arantes DCB, Gomez RS, Noronha VRAS. Osteolipoma: a painless mandibular mass. Oral Sci Int. 2018;15:18–21.
11. Bajpai M, Kumar M, Agarwal D, Agrawal S, Gupta S, Kumar M. Osteolipoma of the palate—an unusual presentation. Natl J Maxillofac Surg. 2014;5:250–1.
12. Battaglia S, Crimi S, Nocini R, Cicciu M, Cervino G, Gurrera A, et al. Intraparotid osteolipoma: treatment option and surgical view. J Craniofac Surg. 2021;32:1894–7.
13. Blashard JD, Veitch D. Ossifying lipoma. J Laryngol Otol. 1989;103:429–31.
14. Bowers ID, Imlay SP, Schroeder N, Bahu SJ. Retropharyngeal osteolipoma requiring an interdisciplinary approach. Ear Nose Throat J. 2022;101(4):231–3.
15. Bulkeley W, Mills OL, Gonzalvo A, Wong K. Osteolipoma of the parapharyngeal space mimicking liposarcoma: a case report. Head Neck. 2012;34:301–3.
16. Castilho RM, Squarize CH, Nunes FD, Pinto Júnior DS. Osteolipoma: a rare lesion in the oral cavity. Br J Oral Maxillofac Surg. 2004;42:363–4.
17. de Castro AL, de Castro EV, Felipini RC, Ribeiro AC, Soubhia AM. Osteolipoma of the buccal mucosa. Med Oral Patol Oral Cir Bucal. 2010;15:e347–9.
18. Diam OS, Ndiaye IC, Ndiaye M, Thiam A, Tall A, Nao EE, et al. Osteolipoma: an unusual tumor of the parotid region. Eur Ann Otorhinolaryngol Head Neck Dis. 2011;128:34–6.
19. Durmaz A, Tosun F, Kurt B, Gerek M, Birkent H. Osteolipoma of the nasopharynx. J Craniofac Surg. 2007;18:1176–9.
20. Firth NA, Allsbrook O, Patel M. Osteolipoma of the buccal mucosa: a case report. Aust Dent J. 2017;62:378–81.
21. Fukushima Y, Kitamura T, Hayashi N, Enoki Y, Sato T, Yoda T. A huge osteolipoma involving the coronoid process: a case report. J Oral Sci. 2016;58:141–4.
22. Godby AF, Drez PB, Field JL. Sublingual lipoma with ectopic bone formation. Report of a case. Oral Surg Oral Med Oral Pathol. 1961;14:625–9.
23. Gokul S, Ranjini KV, Kirankumar K, Hallikeri K. Congenital osteolipoma associated with cleft palate: a case report. Int J Oral Maxillofac Surg. 2009;38:91–3.
24. Hazarika P, Pujary K, Kundaje HG, Rao PL. Osteolipoma of the skull base. J Laryngol Otol. 2001;115:136–9.
25. Hsu HH, Lee LY, Chang KP. Pathology quiz case 2. Osteolipoma of the buccal space. Arch Otolaryngol Head Neck Surg. 2012;138:97–8.
26. Hughes CL. Intraoral lipoma with osseous metaplasia. Report of a case. Oral Surg Oral Med Oral Pathol. 1966;21:576–8.
27. Gakir Karabas H, Ozcan I, Soluk Tekkesin M, Isler SC. Osteolipoma: a review of the literature and a rare case report. Oral Radiol. 2021;37:560–5.
28. Kavusi S, Farahmand V, Davidson TM, Farid N, Shabaik A. Osteolipoma presenting as a submandibular mass: a rare presentation. Head Neck Pathol. 2013;7:93–6.
29. Kumar S, Kumar S, Kulshrestha R. Osteolipoma of the eyelid. Clin Exp Ophthalmol. 2008;36:473–4.
30. Minutoli F, Mazzotti S, Gaeta M, Vinci S, Mastroeni M, Blundino A. Ossifying lipoma of the parapharyngeal space: cT and mRI findings. Eur Radiol. 2001;11:1818–21.
31. Ohno Y, Muraoka M, Ohashi Y, Nakai Y, Wakasa K. Osteolipoma in the parapharyngeal space. Eur Arch Otorhinolaryngol. 1998;255:15–317.
32. Omonte SV, de Andrade BA, Leal RM, Capistrano HM, Souza PE, Horta MC. Osteolipoma: a rare tumor in the oral cavity. Oral Surg Oral Med Oral Pathol Oral Radiol. 2016;122:e8–13.
33. Piattelli A, Fioroni M, Iezzi G, Rubini C. Osteolipoma of the tongue. Oral Oncol. 2001;37:468–70.
34. Raghunath V, Manjunatha BS. Osteolipoma of floor of the mouth. BMJ Case Rep. 2015;2015:bcr2015209883.
35. Ramadass T, Narayanan N. Lipoma of the external ear with osseous metaplasia. Indian J Otolaryngol Head Neck Surg. 2001;53:231–2.
36. Raviraj J, Kumar-Bockkasam V, Suresh D, Venkata S. Osteolipoma of buccal mucosa: case report and literature review. J Clin Exp Dent. 2016;8:e214–8.
37. Saghafi S, Mellati E, Sohrabi M, Raahpeyma A, Salehinejad J, Zare-Mahmoodabadi R. Osteolipoma of the oral and pharyngeal region: report of a case and review of the literature. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2008;105:e30–4.
38. Seelam S, Beeram RK. Osteolipoma in the retromolar trigone: a case report and review of literature. Ann Maxillofac Surg. 2016;6:304–7.
39. Shabbir F, Putnam G. Oral osteolipoma: a case report. Oral Surg. 2014;7:56–8.
40. Sharma S, Dhillon V. Osteolipoma: an extremely rare hard palate tumor. Cureus. 2020;12:e8146.
41. Murphey MD, Johnson DL, Bhatia PS, Neff JR, Rosenthal HG, Walker CW. Parosteal lipoma: MR imaging characteristics. AJR Am J Roentgenol. 1994;162:105–10.
42. Ossifying lipoma and osteolipoma. Vanhoenacker FM, Parizel PM, Gielen JL, editors. Imaging of Soft Tissue Tumors. 4th ed Berlin, Heidelberg, New York: Springer; 2017. p. 221.
43. Fritchie KJ, Renner JB, Rao KW, Esther RJ. Osteolipoma: radiological, pathological, and cytogenetic analysis of three cases. Skeletal Radiol. 2012;41:237–44.
44. Chen Q, Shou P, Zheng C, Jiang M, Cao G, Yang Q, et al. Fate decision of mesenchymal stem cells: adipocytes or osteoblasts? Cell Death Differ. 2016;23:1128–39.
45. Piombino P, Dell’Aversana Orabona G, Abbate V, Fini G, Liberatore GM, Mici E, et al. Circumscribed myositis ossificans of the masseter muscle: report of a case. G Chir. 2013;34:271–4.
46. Kruse AL, Dannemann C, Grätz KW. Bilateral myositis ossificans of the masseter muscle after chemoradiotherapy and critical illness neuropathy: report of a rare entity and review of literature. Head Neck Oncol. 2009;1:30.
47. Gaskin CM, Helms CA. Lipomas, lipoma variants, and well-differentiated liposarcomas (atypical lipomas): results of MRI evaluations of 126 consecutive fatty masses. AJR Am J Roentgenol. 2004;182:733–9.
48. Türköz HK, Yarnalı Y, Comunoğlu C. Bir oğuda baş-boyun bölgesi osteolipomu [A case of osteolipoma of the head and neck area]. Kulak Burun Bogaz Ihtis Derg. 2004;13:84–6.