Introduction

Dermoid cysts are subcutaneous cysts of the ectodermal origin found along the lines of embryonic fusion, which is hamartomatous. The tumor is covered by a thick dermis-like wall that contains multiple sebaceous glands, hairs, and large amounts of fatty masses and almost all skin adnexa. It is a teratoma of cystic nature that contains an array of developmentally mature solid tissues. It frequently consists of skin appendages, hair follicles, and sweat glands, while other commonly found components include clumps of long hair, pockets of sebum, blood, fat, bone nails, teeth, eyes, cartilage, and thyroid tissue. Dermoid cysts grow slowly and contain mature tissue; this type of teratoma is nearly always benign; in rare cases, squamous cell carcinoma usually develops from the wall of the cyst in adults.

Dermoid cyst could be congenital or acquired. Acquired type may be due to trauma. Dermoid cyst usually presents early in life as an asymptomatic mass.

However, they may reach a large size and involve more than one anatomical area and touch the hyoid bone when in the neck. Most dermoid cysts on the floor of the mouth occur in individual aged 10–30 years. However, there are few reports on sublingual dermoid cysts.
of oral dermoid cysts in newborns or children.[4] Dermoid cyst is treated with complete surgical excision, and the prognosis is good. Recurrences of the cyst have been recorded in literature.[4] Sometimes, they may not be noticed until a child is older or an adult. Comorbidities of the sublingual dermoid cyst include upper respiratory tract infection, anemia, respiratory obstruction, feeding difficulties, and esthetic challenges.[5] This report contains 14 cases of sublingual dermoid cyst treated in our center over 8 years.

MATERIALS AND METHODS
A retrospective study of patients who were treated for sublingual dermoid cyst of the oral cavity at Barau Dikko Teaching Hospital over 8 years from January 2010 to December 2017 was done. Fourteen cases were included in this study. The patients were analyzed for age, sex, site of the cyst, comorbidities and approach for surgery, forms of anesthesia, treatments given, and recurrences.

All patients with suspected sublingual dermoid cysts were included in the study.

RESULTS
Fourteen patients were treated, of which 8 (57.1%) were males and 6 (42.9%) were females. The ratio of male to female is 1.3:1.0. Age range of the patients was 1 day to 25 years [Table 1]. Five of the patients were newborn (cases 1–5) and presented with congenital sublingual dermoid cyst in the floor of the mouth [Figure 1a]. The cyst was attached to the ventral surface of the tongue in one of the patients aged 21 years (case 12); in two female adults aged 23 and 25 years (cases 13 and 14), the cysts were bulging from the submandibular and submental spaces [Figure 2a]. The remaining six cases were limited to the floor of the mouth (cases 1–12).

The lesions were no fluctuant, did not transilluminate, and were all located at the floor of the mouth.

The comorbid symptoms include: upper respiratory tract infection, which is the most common, followed by anemia in infants, feeding challenges were mostly encountered in newborns, whereas aesthetics and difficulty in swallowing were common in adults.

Two of our adult patients were restricted to fluid diet (cases 12 and 14). Periodical reduction of the cystic fluid was done by decompression, to reduce the volume of the lesion to allow for ease of breathing and feeding, especially in the newborn before the time of surgery. The newborns had surgery at the age 3 of months, hemoglobin of 10 g/dl, and body weight of 10 pounds or 5 kg, which was considered appropriate for surgery. Endotracheal intubation was difficult until cyst fluid was carefully decompressed to reduce the size. One neonate became cyanosed after intubation and the surgery was postponed. The surgery was done later after he was treated for respiratory tract infection. Axial T1-weighted Magnetic Resonance Imaging (MRI) for case 11 showed a sharply circumscribed cystic mass in the floor of the mouth.

Table 1: Age, sex, and other parameters

<table>
<thead>
<tr>
<th>Cases age</th>
<th>Sex</th>
<th>Site</th>
<th>Duration</th>
<th>Symptoms</th>
<th>Comorbidity</th>
<th>Surgical approach</th>
<th>Histology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Day 1</td>
<td>Male</td>
<td>Sublingual midline</td>
<td>Birth</td>
<td>SRD</td>
<td>URTI</td>
<td>Intraoral</td>
<td>Dermoid</td>
</tr>
<tr>
<td>2 - Day 1</td>
<td>Female</td>
<td>Sublingual midline</td>
<td>Birth</td>
<td>SRD</td>
<td>URTI</td>
<td>Intraoral</td>
<td>Dermoid</td>
</tr>
<tr>
<td>3 - Day 1</td>
<td>Male</td>
<td>Sublingual midline</td>
<td>Birth</td>
<td>SRD</td>
<td>URTI</td>
<td>Intraoral</td>
<td>Dermoid</td>
</tr>
<tr>
<td>4 - Day 1</td>
<td>Male</td>
<td>Sublingual midline</td>
<td>Birth</td>
<td>SRD</td>
<td>URTI</td>
<td>Intraoral</td>
<td>Dermoid</td>
</tr>
<tr>
<td>5 - Day 1</td>
<td>Female</td>
<td>Sublingual midline</td>
<td>Birth</td>
<td>SRD</td>
<td>URTI</td>
<td>Intraoral</td>
<td>Dermoid</td>
</tr>
<tr>
<td>6 - 2/12</td>
<td>Male</td>
<td>Sublingual midline</td>
<td>2 months</td>
<td>SRD</td>
<td>URTI</td>
<td>Intraoral</td>
<td>Dermoid</td>
</tr>
<tr>
<td>7 - 1 year</td>
<td>Female</td>
<td>Sublingual midline</td>
<td>1 year</td>
<td>SRD</td>
<td>Anemia</td>
<td>Intraoral</td>
<td>Dermoid</td>
</tr>
<tr>
<td>8 - 7</td>
<td>Male</td>
<td>Sublingual midline</td>
<td>7 years</td>
<td>RD</td>
<td>URTI</td>
<td>Intraoral</td>
<td>Epidermoid</td>
</tr>
<tr>
<td>9 - 9</td>
<td>Male</td>
<td>Sublingual midline</td>
<td>9 years</td>
<td>AS</td>
<td>None</td>
<td>Intraoral</td>
<td>Epidermoid</td>
</tr>
<tr>
<td>10 - 10</td>
<td>Female</td>
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<td>10 years</td>
<td>AS</td>
<td>None</td>
<td>Intraoral</td>
<td>Epidermoid</td>
</tr>
<tr>
<td>11 - 13</td>
<td>Male</td>
<td>Sublingual midline</td>
<td>13</td>
<td>AS</td>
<td>None</td>
<td>Intraoral</td>
<td>Epidermoid</td>
</tr>
<tr>
<td>12 - 21</td>
<td>Male</td>
<td>Ventral tongue</td>
<td>21</td>
<td>AS</td>
<td>None</td>
<td>Intraoral</td>
<td>Epidermoid</td>
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<tr>
<td>13 - 23</td>
<td>Female</td>
<td>Submandibular Submental</td>
<td>23</td>
<td>SD</td>
<td>Esthetic</td>
<td>Extraoral</td>
<td>Dermoid</td>
</tr>
<tr>
<td>14 - 25</td>
<td>Female</td>
<td>Submandibular Submental</td>
<td>25</td>
<td>SD</td>
<td>Esthetic</td>
<td>Extraoral</td>
<td>Dermoid</td>
</tr>
</tbody>
</table>

SRD=Swallowing and respiratory difficult; RD=Respiratory difficulty; AS=A symptomatic; SD=Swallowing difficulty; URTI=Upper respiratory tract infection

Figure 1: (a) 3-month-old baby boy with sublingual dermoid cyst. (b) 3-month-old baby boy with exposed sublingual dermoid cyst under general anesthesia. (c) Excised cyst.
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[Figure 3] and a Computed Tomography Scan (CT) of the neck for case 14 showed encapsulated left sided mass with multiple cellular masses at the floor of the mouth [Figure 4].

All patients went through routine hematological and biochemical investigations. Computed Tomography Scan (CT) of the neck for case 14 showed encapsulated left sided mass with multiple cellular masses at the floor of the mouth [Figure 4] and Axial T1- weighted Magnetic Resonance Imaging (MRI) for case 11 showed a sharply circumscribed cystic mass in the floor of the mouth [Figure 3]. Eight cases were done under general anesthesia while six under local anesthesia. Two patients (cases 13 and 14) had extraoral approach for the surgical excision, while 12 patients had intraoral approach. The outcome of the treatments was satisfactory. Aspiration cytology was done which revealed cheesy material-containing nonnucleated epithelial cells. A provisional diagnosis of the sublingual dermoid cyst was made. The excised cyst was sent for histology which revealed the following: gross pathological evaluation showed a 2.6 cm × 1.5 cm × 1.0 cm thin-walled, unilocular cystic mass filled with keratin debris.

Microscopically, the cyst lining was composed of stratified squamous epithelium with keratin debris and sebaceous glands with associated hair follicles. The diagnosis of the dermoid cyst was confirmed [Figure 5].

**Surgical procedure**

Midline incision was made along the longitudinal ventral surface of the tongue to the floor of the mouth, and by careful dissection, the cyst was separated out of the mylohyoid muscle [Figure 1b]. This procedure was repeated for all the patients who had intraoral excision. Extraoral approach was done for cases 13 and 14 with submandibular incision 2 mm below the angle of the mandible [Figure 2b], and by careful dissection, the tumor was dissected out [Figure 2c].

**DISCUSSION**

Epidermoid and dermoid cysts of the oral cavity represent <0.01% of all oral cavity cyst.[3] Dermoid cyst of the floor of the mouth is a dysembryogenetic lesion derived from the entrapment and subsequent growth of epithelial cells, during midline fusion between the first and second brachial arches.[5] They usually present early in life as a symptomatic mass.[5] Cases 1–5 in this report were newborns with a large cyst under the tongue, with marked tongue elevation which obstructs...
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feeling and breathing. Needle decompression of the fluid was commenced the same day of presentation to ease feeding and respiration and was done once a week till 3 months when the babies were operated.

Dermoid cyst can be classified into three, considering the location: sublingual, submental, and submandibular cysts. Cases 1–12 were mainly sublingual, while cases 13 and 14 involved the sublingual, submental, and submandibular spaces. Histologically, midline cysts of the floor of the mouth are divided into three types: (1) epidermoid cysts consisting of an epithelial lined wall that may be partly keratinized, (2) dermoid cysts showing evidence of skin appendages such as hair follicles, hair, sweat, and sebaceous glands; and (3) teratomas containing mesodermal elements such as bone, muscle, respiratory and gastrointestinal tissues, and fibrous capsules in addition to skin appendages. In our study, cases 8–12 were epidermoid, while cases 1–7, 12, and 13 were dermoid.

Other rare dermoid cysts in the oral cavity are those on the tongue. Patients with intralingual dermoid cyst were described in the English literature. Case 12 in this report was intralingual cyst, which protruded the dorsum of the tongue.

The cyst is a painless, slow-growing lesion with doughy consistency and is often soft and well encapsulated without associated lymphadenopathy. None of the cases in our report had any lymphadenopathy. The cyst is often located between geniohyoid and mylohyoid muscles, when it bulges out at the submental and submandibular region; careful dissection needed to be done during surgery to avoid damage to the hypoglossal nerve. Cases 13 and 14 who were adult female patients in our report had the cyst bulged out at the submental and submandibular region. Complaints of swelling below the tongue, producing difficulty in feeding in neonates and swallowing of solid foods in adults, and altered speech were common to all our patients.

The sudden increase in size of the cyst is postulated to be due to the onset of puberty when there is an increase in the sebum from the sebaceous glands. Cases 13 and 14 aged 23 and 25 years, respectively, gave similar history that there was fast enlargement of the tumor after attaining the age of 18 years.

Differential diagnosis of the dermoid cyst includes lymphoepithelial cyst, thyroglossal cyst, ranula, cystic hygroma, lymphangioma, and soft tissue abscess. Histologically, the contents of the cyst often contain keratin, sebaceous glands, hairs, nails, fat globules and even cartilages may be present. The histology of case 13 showed a thin walled unilocular cystic mass filled with keratin, the cyst lining is composed of squamous epithelium with keratin debris (asterisk) and sebaceous glands with associated hair follicles. Magnetic resonance imaging (MRI), computed tomography (CT) scan, and ultrasonography are helpful in establishing the differential diagnosis. However, CT and MRI give precise localization to the geniohyoid and mylohyoid muscles and also enable a surgeon to choose the appropriate surgical approach, especially in the case of very large lesions. Axial T1- weighted Magnetic Resonance Imaging (MRI) for case 11 showed a sharply circumscribed cystic mass in the floor of the mouth and a Computed Tomography Scan (CT) of the neck for case 14 showed encapsulated left sided mass with multiple cellular masses at the floor of the mouth. The treatment is surgical excision of the tumor. The gross surgical specimen of excised tumour of case 2 is shown in Figure 2e and Figure 1c shows excised tumour of case 14. The intraoral approach is used for small tumor, while extraoral approach is used for very large sublingual dermoid cysts affecting the submandibular and submental spaces and in cases of infection that could compromise the patient’s airways. Cases 1–12 had excision through intraoral approach, while cases 13 and 14 had extraoral approach. Difficult intubation was experienced in most of the patients. Oftentimes, needle decompression of the fluid was done to reduce volume of the cystic fluids to facilitate endotracheal intubation. The major complications of the lesion were recurrent upper respiratory tract infection, anemia, respiratory obstruction, feeding difficulties, and esthetic challenges. All these were managed in our cases.

Recurrence is very rare with complete excision of the lesion; in our study, two cases of recurrence were reported (cases 11 and 14); their first surgeries were done under local anesthesia; it was likely due to incomplete excision. A 5% rate of malignant transformation of the oral dermoid cysts into the teratoid type has been reported in literature. None of our cases showed any malignant transformation at histology. Recent advances in the management of sublingual dermoid cyst advocates the inclusion of thyroid scintigraphy in the preoperative diagnosis of the cyst of the floor of the mouth, to assess if thyroid gland is involved. Further, surgical enucleation is the only effective treatment for this kind of lesions. All our cases had surgical enucleation. This study has shown that sublingual dermoid cyst could be life-threatening, especially in the newborn, because of difficulty in breathing and recurrent respiratory tract infections. Therefore, special care must commence for the newborn, which should involve a pediatric physician. Prognosis of our cases was very good, with no reported case of recurrence.

**Conclusion**

The results obtained from this study emphasized the need for appropriate surgical treatment to reduce incidence of recurrence. In addition, there is need to treat the lesion urgently because of the difficulties the patients experience in breathing,
swallowing, and periodic respiratory tract infection.

Limitation
The diagnosis of sublingual dermoid cyst in our study was limited to clinical evaluation, fine-needle aspiration biopsy, and histopathology of the cyst wall. However, CT and MRI were not done due to limited resources.

Consent
Consent of patients included in this study was obtained from the time of presentation when the photographs were taken.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest
There are no conflicts of interest.

REFERENCES