Evaluation of different treatments for oroantral/oronasal communications: experience of 112 cases

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Abstract. This retrospective study analyzed the etiologic factors, location and treatments for patients with oroantral or oronasal communications (OAC or ONC). Data analysis extended to gender, age, etiology, location, type of treatment and short-term complications from January 1988 to May 2004. A total of 112 patients with 101 (90%) OAC and 11 (10%) ONC were included. The main etiology for OAC was tooth extraction (95%) with similar prevalence between right (49%) and left (51%) side. For ONC, pathological conditions (27%) and exodontia (27%) were the most prevalent. For the treatment of OAC, suture was the technique most frequently used (60%), followed by buccal fat pad (28%), buccal flap (9%), palatal flap (2%) and one dental transplant (1%). For ONC, the following treatments were used: suture (46%), buccal flap (36%) and palatal flap (18%). Failure to eliminate the communication occurred in six (6%) patients of the OAC group and three (27%) of the ONC group. The results confirm that tooth extraction was the most common etiologic factor for ONC and OAC. Suture, when the communication was small (3–5 mm), and the use of a buccal fat pad (100% successful), when a larger communication existed (>5 mm), seemed to be the two best choices for treatment.

Communication is defined as the space created between the maxillary sinus and the buccal cavity (oroantral, OAC) or between the nasal cavity and buccal cavity (oronasal, ONC). There are many causes of OAC and ONC. They may be the result of cysts, traumas, tumors, pathological entities or even minor surgery. The extraction of maxillary posterior teeth, however, is the most common cause of OAC, because of the anatomically close relationship between the root apices of the premolar and molar teeth and the maxillary antrum, and the thinness of the antral floor in that region, which ranges from 1 to 7 mm.

An OAC of less than 2 mm in diameter tends to close spontaneously, whereas those larger than 3 mm require surgical closure. Various methods for the closure of communications have been reported in the literature, such as local flaps, distant flaps, grafts and the buccal fat pad (BFP). This anatomical structure was
first described by Bichat in 1802, and
Egeland in 1977 was the first to report the
use of BFP for oral reconstruction. After
that, it became usual for the closure of
OAC/ONC and fistulas. Various buccal
mucoperiosteal flaps have been described,
including the rotated flap, advancement
flap, sliding flap and transversal flap. Rehrmann’s technique is the common
buccal flap procedure for closure of a
minor alveolar communication. Having
a broad base, it ensures adequate blood
supply to the flap. Flap mobility is
improved by making parallel incisions
in the peristome at the base of the flap.
Palatal flap procedures are based on
the greater palatine vessels and can usually be
classified as straight advancement or
rotational advancement. The straight-
advancement flap does not offer much
greater mobility for lateral coverage and
thus it is suitable for the closure of minor
palatal or alveolar defects. The palatal rotational-advancement flap, first
described by Ashley in 1939, provides
the flap with adequate mobility and tissue
bulk.

If the communication is not treated or
diagnosed, an epithelial tissue may
develop around its track, which in this
situation is defined as a fistula. In this
study, the terms communication and fis-
tula are used as being the same, although
they have different features.

Material and methods

Of all the patients who were submitted to
oral surgical procedures at the Division of
Oral and Maxillofacial Surgery, State Uni-
versity of Campinas—Piracicaba Dental
School from January 1988 to May 2004,
112 were selected for this study. The data
recorded included patient gender, age,
etiology, location, method of surgical
treatment and short-term complications.
Success was considered to be the complete
closure of the communication.

The surgical methods used for communi-
cation closure varied, from sutures
(approach of the wound edges), palatal
flap (rotational advancement), buccal
flap (Rehrmann’s technique) to the
BFP, especially for large communications. In all these techniques, epithelization
of the fistula tract, osteitis on fistula
margins and infected and degenerated
polyoid mucosa, when present, were
removed before closure of the communica-
tion. Antrol infection was first con-
trolled with antibiotics and antral
irrigation carried out with physiological
solution.

Among the 112 patients, there were 101
OAC (61 men and 40 women, mean age
31.2 years, female-to-male ratio 1:1.52)
and 11 oronasal communications (ONC)
(seven men and four women, mean age
35.6 years, female-to-male ratio 1:1.75).
The highest number of communications
occurred in the third decade of life for
OAC and the fifth decade for ONC
(Table 1).

The causes of ONC were pathological
lesions (periapical cyst) (three), tooth
extraction (three), blastomycosis (one),
sequelae of gun-shot wound (two), con-
genital (one) and removal of a dental
implant that had been pushed into the
nasal cavity (one). The involved teeth
were left and right impacted canines, peri-
apical lesion of the left lateral incisive and
mesiodens. Five repairs were treated by
suture, two by palatal flap and four by
buccal flap.

The cause of OAC was tooth extraction in
96 patients, pathological lesion in three,
trauma in one, and periapical infection in
one. The incidence of OAC on the right
and left sides was similar (Table 2).

Results

Oronasal communication

Eight patients were successfully treated
without complications but in the other
three patients, treatment failed. In one
patient, who was suffering from anemia
and tuberculosis, tissue healing was
altered and the surgical procedure failed.
The second patient, in whom the communica-
tion originated from a dental implant
removal, was unsuccessfully treated
because of suture dehiscence. A second
surgical procedure was not attempted
because the bone defect was too large
and the patient did not want to undergo a
bone-grafting procedure. In the third
patient, further surgery using a palatal flap
was tried, but it failed resulting in necro-
sis. An obturator prosthesis was the defi-
nitive treatment, for all of these three
patients. These three patients denied the
consumption of alcohol or smoking.

Oroantral communication

Treatments consisted of 61 sutures, 28
BFPs, 9 buccal flaps, 2 palatal flaps and 1
dental transplantation. A second surgical
procedure was necessary in six patients
(Table 3). Two palatal flaps, two buccal
flaps and two BFPs were used in the
second successful procedures. Only one
patient, who needed a second surgery, had
a noxious habit (smoker).

The chosen approach for exposing the
BFP was a horizontal vestibular incision in
the maxillary molar region. In some cases,
the BFP was already visible through expor-
sure. The BFP was mobilized by blunt
dissection and grasped with a thin hook,
transposed into the defect, expanded and
sutured to the margins. One patient was
WARDED with a BFP in the anterior region.
The communication occurred during an
impacted canine extraction. The surgical
procedure using the BFP was possible
because this patient was edentulous on the
side of the communication.

Table 1. Prevalence of patients with OAC and ONC according to decade of life

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number of OAC (%)</th>
<th>Number of ONC (%)</th>
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</thead>
<tbody>
<tr>
<td>11–20</td>
<td>20 (20)</td>
<td>1 (9)</td>
</tr>
<tr>
<td>21–30</td>
<td>40 (39)</td>
<td>3 (27)</td>
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<tr>
<td>31–40</td>
<td>17 (17)</td>
<td>2 (18)</td>
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<td>41–50</td>
<td>13 (13)</td>
<td>4 (37)</td>
</tr>
<tr>
<td>51–60</td>
<td>8 (8)</td>
<td>1 (9)</td>
</tr>
<tr>
<td>61–70</td>
<td>3 (3)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Total</td>
<td>101 (100)</td>
<td>11 (100)</td>
</tr>
</tbody>
</table>

Table 2. Prevalence of OAC related to site

<table>
<thead>
<tr>
<th>Region</th>
<th>Right</th>
<th>Left</th>
<th>Total (%)</th>
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<tbody>
<tr>
<td>Canine</td>
<td>1</td>
<td>2</td>
<td>3 (02)</td>
</tr>
<tr>
<td>First premolar</td>
<td>2</td>
<td>0</td>
<td>2 (02)</td>
</tr>
<tr>
<td>Second premolar</td>
<td>3</td>
<td>3</td>
<td>6 (06)</td>
</tr>
<tr>
<td>First molar</td>
<td>12</td>
<td>17</td>
<td>29 (29)</td>
</tr>
<tr>
<td>Second molar</td>
<td>6</td>
<td>10</td>
<td>16 (16)</td>
</tr>
<tr>
<td>Third molar</td>
<td>25</td>
<td>20</td>
<td>45 (45)</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>52</td>
<td>101 (100)</td>
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</table>

Table 3. Treatment modality and complications in OAC patients

<table>
<thead>
<tr>
<th>Surgical technique</th>
<th>Number of patients (%)</th>
<th>Number of complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suture</td>
<td>61 (60)</td>
<td>4</td>
</tr>
<tr>
<td>Buccal fat pad (BFP)</td>
<td>28 (28)</td>
<td>0</td>
</tr>
<tr>
<td>Buccal flap</td>
<td>9 (9)</td>
<td>1</td>
</tr>
<tr>
<td>Palatal flap</td>
<td>2 (2)</td>
<td>1</td>
</tr>
<tr>
<td>Dental transplantation</td>
<td>1 (1)</td>
<td>0</td>
</tr>
</tbody>
</table>
Discussion

There are many techniques describing the closure of an OAC and ONC. When determining how to treat a communication, the surgeon must take into account its size, the presence of infection and the time of diagnosing the communication.

The presence of maxillary sinusitis, epithelialization of the fistula tract, osteitis or osteomyelitis on fistula margins, a foreign body, dental cysts, a dental apical abscess, or tumors prevents spontaneous healing and results in chronic fistulas. Sinusitis may occur as a result of an oroantral fistula, and it is important that it should be treated first. Any foreign bodies, infected and degenerated polyoid mucosa, or infected bone should immediately be removed. A Caldwell-Luc procedure, with nasal antrostomy, is indicated in only those few cases where severe sinusitis is present prior to the antrum being exposed. None of our cases of OAC required such radical surgical intervention.

Von Bondsdorff studied 84 human skulls and found that second molar roots usually related to an OAC. ONC is a rarer and more challenging condition. The 100% success rate using the BFP in the present study is outstanding. In some patients, multiple surgical interventions may be necessary for successful closure.

References


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