Cyanosis Of The Tongue: A Rare Complication Of LMA
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Citation
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Abstract
We present a case report of a patient who developed cyanosis of the tongue during anesthesia using the laryngeal mask
airway. Cyanosis was thought to be due to compression and occlusion of both lingual vessels. Cyanosis resolved rapidly within
one hour. The patient did not suffer paraesthesia or any permanent motor or sensory damage of the tongue.
There are few case reports of complications associated with the use of laryngeal mask airways LMA’s. These may directly
relate to the use of the LMA or as a consequence of not using another technique such as an endotracheal tube. Most of the
direct complications result from compression of surrounding structures. These include sore throat, laryngeal nerve palsy, lingual
nerve palsy, alteration of taste/swallowing/ speech, rarely tongue cyanosis or tongue cyanosis with swelling. We are describing
a case of tongue cyanosis after laryngeal mask airway insertion.

CASE HISTORY
A 45 years old female of 60kg weight, ASA physical status 1
was scheduled for modified radical mastectomy. Her
medical history was unremarkable. Physical examination
revealed a Mallampati Grade 1 airway. Anesthesia was
induced with morphine, propofol and vecuronium. A size 3
laryngeal mask airway was placed easily, with bilateral
equal breath sounds. Placement was confirmed by the
presence of carbon dioxide on a capnomac. The laryngeal
mask airway cuff was inflated with 20 ml air. Anesthesia
was maintained with isoflurane, nitrous oxide, oxygen and
vecuronium. Surgery lasted for two and half hours. After
surgery, muscle relaxation was reversed with neostigmine
and atropine. The LMA cuff was deflated and the LMA
removed. Tongue cyanosis was noted at the time of removal
of the LMA. The patient was hemodynamically stable and
maintained a saturation of 100%. She was fully awake and
followed commands. She was kept under observation for 2
hours in the postoperative period. The tongue became pink
within one hour after surgery. Arterial blood gas analysis
was normal.

DISCUSSION
Before discussing this case it is mandatory to know the
anatomy of the blood supply of the tongue. The venous
drainage of the tongue is via two main routes – dorsal
lingual and deep lingual vein. The dorsal lingual vein drains
the dorsum and lateral aspects of the tongue and joins the
lingual vein along side the lingual artery and finally drains
into the internal jugular vein at or near the greater cornu of
the hyoid bone. The deep lingual vein commences at the tip
of the tongue passes along the ventral surface just beneath
the mucosa. This then joins the sublingual vein and passes
with the hypoglossal nerve between hypoglossus and
mylohyoid muscles to drain into the internal jugular, facial,
or lingual vein.

A case of tongue swelling and cyanosis associated with use
of LMA was described in another case report in which they
noted this problem towards the end of the surgical
procedure. The most likely cause in this case was direct
venous compression. In another case, laryngeal nerve injury
caued by LMA has been reported. However, a literature
review of complication following the use of LMA’s found
reports of damage not only to recurrent laryngeal nerve but
also to other adjacent nerves namely the hypoglossal and
lingual nerve. These were neuapraxic injuries which
eventually resolved. A case of unilateral vocal cord palsy
requiring thyroplasty for voice restoration has been reported.
Very rarely neural problems following LMA use may
cause alteration of taste, swallowing and speech. We believe
that in our case the laryngeal mask airway was occluding the
patients’ lingual artery bilaterally. The cause of compression
of the lingual artery may be due to malpositioning, size of
LMA it self, or the cuff may also be a factor. Mask size
cannot be a factor because we have chosen size 3 mask.
Malpositioning can be ruled out as surgery lasted for two
and half hour and there was no leak. The patient was
hemodynamically stable and maintained saturation of 99-
100 % throughout the operation. We believe that an increase
in cuff pressure was the probable cause in our case, as we all
know that LMA cuffs are highly permeable to nitrous oxide
and cuff pressure increases during anaesthesia using nitrous
oxide. This mechanism may have contributed to the
obstruction seen in this case.

To avoid the risk of an undetected increase in cuff pressure,
a monitoring transducer has been recommended so that cuff
can be deflated accordingly. Brain notes that the
recommended initial inflation volume is actually the
maximum volume and advises cuff inflation up to 60 mm of
H2O with ongoing monitoring. If a significant leak occurs a
larger LMA should be used. Although tongue swelling as
consequence of LMA use appears to be a rare occurrence,
we would recommend periodic checking of the tongue,
device position and correct selection of mask size.

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