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## CLINICAL INFORMATION

### Bilateral mandibular nerve injury following mask ventilation: a case report



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#### KEYWORDS

Mandibular nerve injury;  
Mask ventilation;  
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#### Abstract

**Background and objectives:** Nerve injury following mask ventilation is a rare but serious anesthetic complication. The majority of reported cases are associated with excessive pressure applied to the face mask, long duration of mask ventilation, excessive digital pressure behind the mandible to relieve airway obstruction and pressure exerted by the plastic oropharyngeal airway.

**Case report:** We present a case of bilateral mandibular nerve injury following mask ventilation with short duration, most likely due to a semi-silicone facemask with an over-inflated cushion.

**Conclusion:** An over-inflated sealing cushion of a facemask may trigger difficult mask ventilation leading to mandibular nerve injury following mask ventilation. Alternative airway management techniques such as laryngeal mask airway should be considered when airway maintenance can only be achieved with strong pressure applied to the facemask and/or mandible.

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#### PALAVRAS-CHAVE

Lesão do nervo mandibular;  
Ventilação com máscara;  
Anestesia

#### Lesão do nervo mandibular bilateral após ventilação com máscara: um relato de caso

#### Resumo

**Justificativa e objetivos:** A lesão nervosa após ventilação com máscara é uma complicação anestésica rara, mas grave. A maioria dos casos relatados está associada à pressão excessiva aplicada à máscara facial, ao tempo prolongado de ventilação, à pressão digital excessiva atrás da mandíbula para aliviar a obstrução das vias aéreas e à pressão exercida pela cânula orofaríngea.

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*Relato de caso:* Apresentamos um caso de lesão do nervo mandibular bilateral após uma ventilação de curta duração via máscara, provavelmente devido ao uso de uma máscara facial (de semissilicone) com insuflação excessiva da almofada.

*Conclusão:* A insuflação excessiva da almofada de uma máscara facial pode desencadear uma ventilação com máscara difícil, levando à lesão do nervo mandibular após a ventilação. Técnicas alternativas de manejo das vias aéreas, como o uso de máscara laríngea, devem ser consideradas quando a manutenção das vias aéreas só pode ser obtida com forte pressão aplicada à máscara facial e/ou mandíbula.

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## Introduction

Injury of nerves which innervate lower facial region following mask ventilation is a rare anesthetic complication. The majority of cases reported have been associated with excessive pressure applied to the face mask, long duration of mask ventilation, excessive digital pressure behind the mandible to relieve airway obstruction and pressure exerted by the plastic oropharyngeal airway.<sup>1-9</sup> However, there is little knowledge about the relationship between nerve injury and the type of the facemask or the amount of air in its cushion.

We present a case of bilateral mandibular nerve injury following difficult mask ventilation most likely due to a semi-silicone facemask with an over-inflated cushion. Written consent for publication of this report was obtained from the patient.

## Case description

A 51 years old woman underwent an endometrial biopsy under general anesthesia. She had no prior history of the medical problem. Anesthesia was induced with midazolam 1 mg, fentanyl 100 µg and propofol 150 mg and maintained with sevoflurane in nitrous oxide-oxygen administered by the face mask. Jaw thrust and tight facemask (size 4) seal using digital pressure with both hands were required for adequate mask ventilation. A Guedel airway was also inserted. The surgical procedure lasted 9 min and the patient was ventilated for 14 min. She was then transferred to the recovery room and discharged home the same day. Five hours after the procedure, the patient presented to the anesthetic department complaining of numbness at both sides of her chin and lower lip. She described her sensations as similar to the numb feeling after dental treatment under local anesthesia. Clinical assessment showed bilateral parotid tenderness and loss of temperature and touch perception at both sides of her chin and lower lip. There was no motor deficit. Neurological evaluation performed by a neurologist revealed that the area of numbness corresponded to the area of innervation of the mandibular divisions of the right and left trigeminal nerves (Fig. 1A). Treatment with a non-steroid anti-inflammatory agent and vitamin B was started.

Follow-up of the patient revealed that bilateral parotid tenderness and the numbness at the left side of her face were improved gradually and recovered completely in 1 week (Fig. 1B). The numbness at the right side of her face was also regressed gradually from her chin to a small area under the right side of her lower lip after 3 weeks (Fig. 1C). Complete remission occurred within 5 weeks.

## Discussion

Sensory and/or motor nerve dysfunction of the mental nerve, inferior alveolar nerve, mandibular division of trigeminal nerve and facial nerve following mask ventilation have been reported with several case reports since 1950s.<sup>1</sup> Reported cases of nerve injuries associated with mask ventilation under general anesthesia are presented in Table 1. The majority of cases were associated with long duration of mask ventilation and/or difficult mask ventilation.<sup>2-7</sup> However, cases with easy ventilation and short duration were also reported.<sup>1,8,9</sup> Although digital pressure is frequently applied to the facemask and/or the mandible to relieve airway obstruction during mask ventilation in anesthesia practice, the reported cases of nerve injury are infrequent. Possible explanations may be individual differences, anatomical variations or hereditary predisposition. Moreover, there may be many unreported cases.

Difficult mask ventilation is described as the clinical situation that develops when it is not possible for the anesthesiologist to provide adequate mask ventilation due to inadequate mask seal, excessive gas leak or excessive resistance to the ingress or egress of gas.<sup>10</sup> Additionally, technical problems, inadequate depth of anesthesia, patient and equipment related factors, separately or combined, may lead to difficult mask ventilation.<sup>10</sup> Several authors reported the incidence of difficult mask ventilation between 1.4% and 5% and found various risk factors such as male gender, age older than 55 year, body mass index more than 26 kg.m<sup>-2</sup>, lack of teeth, history of snoring, presence of a beard, Mallampati Class III or IV and limited mandibular protrusion test.<sup>11</sup> Although none of the risk factors were present in our patient, mask ventilation was

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