

Subcutaneous Emphysema Induced by Supplementary Oxygen Delivery Nasopharyngeal Cannula. Case Report

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Summary: Gasparini JR, Ferreira LC, Rangel VHM – Subcutaneous Emphysema Induced by Supplementary Oxygen Delivery Nasopharyngeal Cannula. Case report.

Background and objectives: The development of subcutaneous emphysema involving face, neck, and thorax has been well-documented in cases of odontologic procedures, head and/or neck surgery, and craniofacial trauma. Its development without known damage to the mucosa is rare. This report describes the case of a patient who developed emphysema without an obvious lesion.

Case report: This is a male patient, healthy, undergoing epidural blockade and local anesthesia associated with sedation for lipoaspiration of the abdomen and submentonian region. Intercurrences were not observed during the procedure until a nasopharyngeal cannula was placed for oxygen administration. We also describe an alternative approach for its resolution.

Conclusions: Although rare, subcutaneous emphysema can have serious repercussions. Manual lymphatic drainage can be an option for the treatment of this aesthetical complication.

Keywords: COMPLICATONS: subcutaneous emphysema; SURGERY, Plastic: lipoaspiration.

[Rev Bras Anesthesiol 2010;60(5): 558-562] ©Elsevier Editora Ltda.

INTRODUCTION

Supplementary oxygen is commonly administered to patients in the postoperative period. Complications associated with nasal cannulae are rare and several well-known text books do not refer to those complications. However, nothing is devoid of risks, it does not matter how small they might be.

The development of subcutaneous emphysema through the administration of supplementary nasal oxygen is rare and very few cases have been reported. This report illustrates it and makes some comments on possible clinical complications.

CASE REPORT

This is a 38 years old male patient, healthy, without known drug allergies, and without history of surgeries. He was scheduled for lipoaspiration of the abdomen and submentonian re-

gion. Preoperative ancillary tests, including CBC, electrocardiogram, prothrombin time, partial activated thromboplastin time, creatinine, and BUN were within normal limits.

The patient did not receive pre-anesthetic medication. He was calm and fasting upon arrival in the operating room. A venoclysis was performed in the right upper limb and infusion of NS was instituted.

He was monitored with continuous cardioscopy, pulse oximetry, and non-invasive blood pressure with automatic measurements at 5-minute intervals. He was placed on right lateral decubitus and sedated with midazolam and ketamine hydrochloride.

An spinal anesthesia was performed in the T12-L1 space without intercurrences. Twenty milliliters of 2% lidocaine without vasoconstrictor and 10 mL of 1% ropivacaine were administered that provided for an effective blockade with a 10-minute latency.

Further sedation was composed of bolus of midazolam and fentanyl as needed. Supplementary O₂ was not administered, since the patient maintained oximetry above 92% in room air. The patient received dypirone 2 g, ketoprofen 100 mg, dexamethasone 10 mg, and cephalothin 2 g, intravenously.

Lipoaspiration of the abdomen was initiated lasting approximately for 120 minutes and with the aspiration of 1,600 mL without intercurrences. Until this point, the patient had received 2,000 ml of warmed crystalloids.

Lipospiration of the submentonian region was set to be performed under local infiltrative anesthesia. During preparations for the procedure, a #14 urethral silicon tube (Embramed, São Paulo, SP) was introduced through the left nostril for administration of supplementary oxygen. A 2% lidocaine gel was used to lubricate the tube, which was inserted without resistance (8 cm). Supplementary oxygen was administered at 6 L.min⁻¹.

Received from Clínica Bonica de Cirurgia Plástica, Belo Horizonte – MG.

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Submitted on January 28, 2010.
Approved on May 3, 2010.

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Immediately, the patient developed psychomotor agitation. An increase in the volume of the face of the patient was observed, as well as respiratory difficulty. Along with the increase in the volume of his face an increase in the volume of the cervical region and thorax (supraclavicular) was observed. After palpation, subcutaneous emphysema was diagnosed. The oxygen flow was turned off and the nasal tube was removed.

The patient remained agitated and oxygen was administered via face mask. Oximetry levels declined and when it reached 80% it was decided to intubate the patient. Propofol and succinylcholine were used for induction. Laryngoscopy showed the presence of oropharyngeal emphysema, uvula, and tongue. Despite the reduction in the caliber of the cavities, the patient was easily intubated (#8.0 tube). The lower level of oximetry reached 74%.

The patient was manually ventilated with 100% O₂ with prompt normalization of the oximetry. Hemodynamic instability was not observed. The case was discussed with the plastic surgeon, and a decision to continue the procedure was made.

General anesthesia was maintained with propofol infusion. Non-depolarizing muscular relaxants or new doses of succinylcholine were not used. The lipoaspiration was performed without interurrences.

After the end of the procedure, the patient remained intubated. Since a professional with experience in manual massage for lymphatic drainage was available, it was decided to request her help. After the intervention, a regression of approximately 90% of the volume of the thorax and neck, and 70% of the face was observed.

Propofol was discontinued and the patient was extubated after he had shown a reaction to the tube and good ventilatory pattern. He was sleepy, but he was easily awakened when called by his name, eupneic, and hemodynamically stable. His oximetry was maintained at 86% in room air, and 92% with supplementary oxygen via nasal cannula (Sanobiol, Pouso Alegre, MG, Brazil), 2 L.min⁻¹.

He remained in the recovery room for 4 hours and 30 minutes. During this time, he only complained of pain in the abdominal region, being medicated with paracetamol (500 mg orally) associated with codeine (30 mg).

The patient was discharged to the room without visible changes of his face, neck, and thorax. He was oriented, without any complaints, eupneic, hemodynamically stable, and maintained a pulse oximetry of 92% in room air.

He remained under observation for another 6 hours, only complaining of pain in the abdominal region (medicated with intravenous dypirone and morphine). He was discharged from the hospital and did not develop any other interurrence.

The patient did not develop delayed complications related to the anesthetic interurrence or the surgery.

DISCUSSION

The development of subcutaneous emphysema of the face, neck and thorax has been well documented in odontologic procedures¹⁻⁴, head and/or neck surgeries⁵⁻⁷, and orofacial trauma^{8,9}. Mucosal discontinuities allow the entrance of gases under pressure – and this is the main mechanism involved. Only two cases similar to ours^{10,11} that did not involve procedures related to the oropharyngeal or nasopharyngeal mucosae were found in the literature.

The space formed by the pharyngeal, sublingual, and submandibular submucous tissue shows a discontinuity with the cervical space through its anterosuperior portion¹². The cervical space communicates, inferiorly, with the mediastinum through the trachea and large vessels (anterior), and with the pleural space, posteriorly, until the fourth thoracic vertebra. Thus, face and neck emphysema can determine pneumothorax and pneumomediastinum, which can lead to emphysema of the neck and face^{13,14}.

Small volumes cause little changes, which lead to morphologic changes in the face and neck (increase in volume), with purely aesthetic implications. Large volumes can cause pneumothorax and pneumomediastinum with severe repercussions. In this case, despite the easy intubation, there was an increase in the volume of the tongue, oropharyngeal mucosa, larynx and cervical circumference that could have led to a difficult airway. Note that spontaneous ventilation was difficult even after the introduction of a Guedel cannula.

Treatment is supportive. In general, it resolves within 24 hours due to the absorption of the gases by adjacent tissues. In this case, manual lymphatic drainage was used in an attempt to accelerate the resolution of the process. Manual lymphatic drainage can be used to reduce the lymphedema associated with neoplasias^{15,17}. There were no reports related to its use for the clinical picture described here.

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Resumen: Gasparini JR, Ferreira LC, Rangel VHM – Enfisema Subcutáneo Causado por Sonda Nasofaríngea para la Administración de Oxígeno Suplementario. Relato de Caso.

Justificativa y objetivos: La incidencia del enfisema subcutáneo que llega a la cara, cuello y tórax está bien documentada en casos de procedimientos odontológicos, cirugía de cabeza y/o cuello y trauma craneofacial. Su apareamiento sin lesión reconocida de las mucosas es raro. Este relato describe un caso clínico en que el enfisema se dio sin una lesión obvia.

Relato del caso: Paciente del sexo masculino, sano, sometido a anestésicas epidural y local, asociadas a la sedación para la realización de liposucción de abdomen y de la región submentoniana. Procedimiento sin intercurencias hasta colocar una sonda nasofaríngea para administrar oxígeno suplementario. También describe un abordaje alternativo para su resolución.

Conclusiones: Aunque sea raro, el enfisema subcutáneo a veces puede tener graves consecuencias. El drenaje linfático manual puede ser una opción para el tratamiento de la complicación estética.