

Acute Unilateral Parotid Glands Enlargement Following Endotracheal General Anesthesia: Report of Two Cases

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Acute parotid gland enlargement in association with general anesthesia is rare and has also been called anesthesia mumps. We present two patients who were scheduled for lumbar spine surgery under general anesthesia. Each developed acute unilateral parotid gland enlargement over one side of the face proven by sonography. Case 1: A 52-year-old man was scheduled for his third lumbar spine to first sacral spine surgery for scoliosis and spondylolisthesis. The patient was provided general anesthesia with oral endotracheal intubation and placed in the prone position with the neck flexed at approximately 10 degrees. The head was turned to the left side and the right side of the face was placed on a soft gel rolling pad. After 6 hours of surgery, swelling of the right parotid gland was noted upon endotracheal extubation. Twenty four hours later, the patient received sonographic examination of the salivary gland which showed dilatation of the right parotid duct with obstructive inflammation. After receiving non-steroidal anti-inflammatory drug (NSAID) treatment, his symptoms and signs subsided 2 weeks after the surgery. Case 2: A 53-year-old woman was scheduled for her third lumbar spine to fifth lumbar spine instrumentation and internal fixations for spondylolisthesis. A similar anesthetic regimen and surgical position was provided as with Case 1. The duration of the surgery was about 5 hours and swelling of the right parotid gland was also noted postoperatively. Sonographic examination of the salivary gland showed only an inflammatory process without dilatation of the parotid duct. She had complete recovery of the condition 10 days after surgery. There were no complications nor residual enlargement of the parotid gland in either of our two patients after conservative treatment. (*Chang Gung Med J* 2007;30:453-7)

Key words: parotid gland, anesthesia, sonography

The usual causes of acute parotid glands enlargement include pneumoparotid,⁽¹⁾ iatrogenic traumatic parotitis,⁽²⁾ acute sialadenitis⁽³⁾ and obstruction of the parotid duct.⁽⁴⁾ Acute enlargement and swelling of the parotid glands in association with anesthesia is rare, and without sonographic documentation. In this article, we present two cases of acute unilateral parotid gland enlargement following endotracheal general anesthesia for lumbar spinal surgery and

confirm obstruction of the parotid duct by sonography.

CASE 1

A 52-year-old, 75 kg, man was scheduled for his third lumbar spine to first sacral spine instrumentation and internal fixation of segment L3 to S1 for scoliosis and spondylolithesis. His medical history

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revealed no specific findings except for chronic hepatitis B. The preoperative results of biochemical studies, chest x-ray and electrocardiography were normal. Physical examination revealed limitation of movement of the left thigh. General anesthesia was induced with intravenous 275 mg thiopental, 150 µg fentanyl, 50 mg rocuronium and maintained with sevoflurane under full monitoring. After oral tracheal intubation, an endotracheal tube was fixed on the left side of mouth and kept at 22 cm in depth. Twenty minutes after intubation, the patient was placed in the prone position with the neck flexed at approximately 10 degrees. The head was turned to the left side and the right side of the face was placed on a soft gel rolling pad. The surgery proceeded for about 6 hours. The total blood loss was about 750 ml. After

endotracheal extubation, swelling of the parotid gland was noted. The swelling parotid gland increased in size and hardness. Painful sensations were complained of after the patient was sent to the post-anesthesia recovery unit (Fig. 1). Twenty four hours after the surgery, the patient received sonographic examination of the salivary gland which showed enlargement of the right parotid gland and dilatation of the parotid duct (Fig. 2). Persisting painful sensations and swelling were noted for 3 days. The patient received non-steroidal anti-inflammatory drug (NSAID) treatment. One week after surgery, his symptoms and signs subsided except for the swelling that persisted for another 2 weeks before complete recovery.



Fig. 1 Enlargement of the right parotid gland in Case 1.

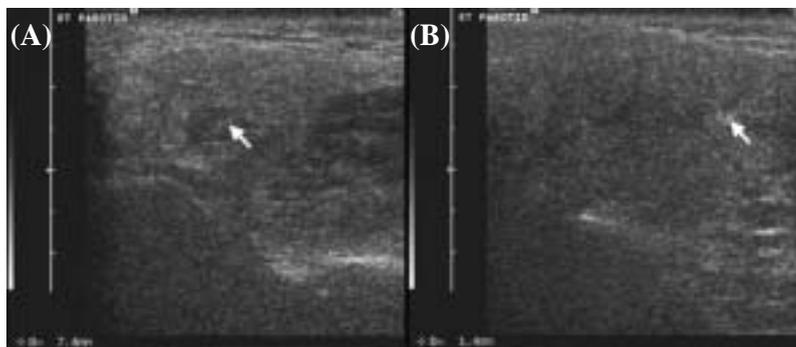


Fig. 2 Sonography of the right parotid gland. (A) Dilatation of the proximal parotid duct (arrow); 7.8 mm in diameter. (B) Dilatation of the distal parotid duct (arrow); 1.4 mm in diameter.

CASE 2

A 53-year-old, 56 kg, woman was scheduled for her third lumbar spine to fifth lumbar spine instrumentation and internal fixations for spondylolisthesis. There were no specific findings in her medical history. Results of routine preoperative studies were within normal limits. This patient received similar anesthetic regimen and surgical position as with Case 1. The right side of the face was also placed on a soft gel rolling pad. The duration of the surgery was about 5 hours with a total blood loss of 450 ml. After the surgery, swelling of the right parotid gland was also noted. Painful sensation was complained of in the recovery room (Fig. 3). Twenty-four hours after the surgery, the patient received sonographic examination of the salivary gland which showed inflammation in the right parotid gland without dilatation of the parotid duct (Fig. 4). Persisting painful sensation and swelling were noted for 2 days and NSAIDs were prescribed. She had complete recovery 10 days after the surgery.

DISCUSSION

Acute transient enlargement of the parotid gland in anesthetized patients, also known as anesthesia mumps,⁽⁵⁾ is rare. The swelling and enlargement are transient and may last for several minutes to several days. The majority of cases were found after the patient underwent anesthesia for a long time. The condition was first reported by Attas et al.⁽⁶⁾ and later a few cases were reported by Bonchek⁽⁷⁾ and Kimura et al.⁽⁸⁾ Reilly⁽⁹⁾ reported an incidence of three in 1500 patients who underwent general anesthesia and Matsuki et al.⁽¹⁰⁾ reported that five in 3000 patients presented with acute transient swelling of salivary glands during and following endotracheal anesthesia. They believed that inadequate anesthesia during intubation, overactive pharyngeal reflex stimulation of the salivary gland via the parasympathetic nerves and succinylcholine-stimulated copious secretions were the major causes of acute salivary glands enlargement during induction of anesthesia.

In adults, the area of the parotid gland varies



Fig. 3 Enlargement of the right parotid gland in Case 2.

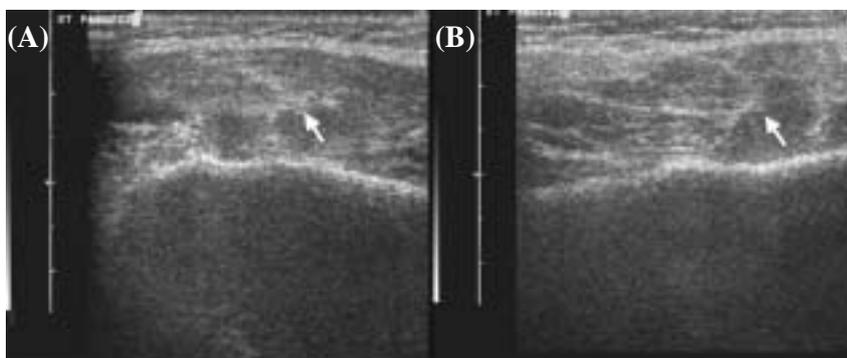


Fig. 4 Sonography of right parotid gland: hyperechogenic (arrow) swelling of parotid gland and no dilatation of parotid duct. (A) Transverse view. (B) Longitudinal view.

from 10.1 to 21.2 cm² in the lateral view. The parotid duct is approximately 6 cm in length and 0.8 to 3.2 mm in diameter,⁽¹¹⁾ but the normal parotid duct is not easily visible using sonography.⁽¹²⁾ In our report, both patients were placed in the prone position with the right side of the face dependent on a circular pad. Their faces suffered mechanical pressure and decreased venous return due to neck rotation and mechanical ventilation. Comparing our patients, Case 1 had a heavier body weight, surgical duration was longer and the amount of blood loss was higher. Retention of saliva due to blockage of the parotid duct by swelling of the lining epithelial cells resulted in swelling of parotid gland, especially following prolonged surgery and massive bleeding during operation. Parotid gland sonography, in Case 1 showed obvious parotid duct obstruction with marked hyperechogenic pattern but only a moderate hyperechogenic pattern was shown for Case 2. The recovery time for the first patient was longer suggesting a greater inflammatory response.

We believe the presence of the patient's underlying disease, choice of anesthetic drugs, surgical position, operative site (such as head and neck surgery) and induction methods (such as endotracheal tube, laryngeal mask inadequate insertion and fixation) may all contribute to the development of acute swelling of the parotid glands during general anesthesia. There were no medical illnesses or infectious diseases in our two cases and their induction courses were smooth. As for the anesthetic drugs used in our two patients, Sevoflurane has an inhibitory effect on salivation due to central nervous system depression. Thiopental and fentanyl tend to depress rather than stimulate salivation and rocuronium has no evidence of increasing salivary secretions.

To prevent this complication, we suggest the use of an adaptive shaped soft pad to avoid direct compression of the parotid gland and ducts, premedication with anticholinergic drugs to decrease secretions, smooth intubation and extubation to avoid mechanical stimulation, and limitation of the range of neck flexion or rotation to keep normal venous blood circulation, especially when the patient is

placed in the prone position or the duration of surgery is long. When swelling of the parotid gland with duct obstruction is suggested, anti-inflammatory drugs and antibiotics should be administered.

In summary, anesthesia-related inflammatory parotitis is rare but can be avoided. In our two cases, improper prone positions with prolonged mechanical compression of the parotid gland leading to parotid duct obstruction were highly suggested to be contributory factors. Proper use of anesthetic medication and technique, with adequate patient protection may help decrease this complication.

REFERENCES

1. Telfer MR, Irvine GH. Pneumoparotitis. *Br J Surg* 1989;76:978.
2. Brodie HA, Chole RA. Recurrent pneumosialadenitis: a case presentation and new surgical intervention. *Otolaryngol Head Neck Surg* 1988;98:350-3.
3. Bradley PJ. Benign salivary gland disease. *Hosp Med* 2001;62:392-5.
4. Bull PD. Salivary gland stones: diagnosis and treatment. *Hosp Med* 2001;62:396-9.
5. Reilly DJ. Benign transient swelling of the parotid glands following general anesthesia: "anesthesia mumps". *Anesth Analg* 1970;49:560-3.
6. Attas M, Sabawala PB, Keats AS. Acute transient sialadenopathy during induction of anesthesia. *Anesthesiology* 1968;29:1050-2.
7. Bonchek LI. Salivary gland enlargement during induction of anesthesia. *JAMA* 1969;209:1716-8.
8. Kimura H, Watanabe Y, Mizukoshi K, Yamamoto Y, Araki S. Six cases of anesthesia mumps. *Nippon Jibiinkoka Gakkai Kaiho* 1993;96:1915-21.
9. Reilly DJ. Benign transient swelling of the parotid glands following general anesthesia: "anesthesia mumps". *Anesth Analg* 1970;49:560-3.
10. Matsuki A, Wakayama S, Oyama T. Acute transient swelling of the salivary glands during and following endotracheal anaesthesia. *Anaesthesist* 1975;24:125-8.
11. Ericson S. Sialographic appearances of the normal parotid gland. *Acta Radiol Diagn (Stockh)* 1973;14:593-612.
12. Bruneton JN, Mourou MY. Ultrasound in salivary gland disease. *ORL J Otorhinolaryngol Relat Spec* 1993;55:284-9.

氣管插管全身麻醉後急性單側唾液腺腫大——二病例報告

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在全身麻醉後發生急性唾液腺增大是罕見的，又被稱為麻醉腮腺炎。本篇報告二例在接受全身麻醉腰椎手術後，在病患支撐臉部發生急性單側唾液腺腫大情形並有超音波佐證此發現。病例一：一位 52 歲男性因脊椎側彎及第三腰椎脊椎滑脫接受常規腰椎內固定手術，病人接受全身插管麻醉，手術姿勢為俯臥頸部彎曲 10 度，頭轉向左側，右臉靠在圓形軟墊上。手術時間約 6 個小時，手術麻醉結束後發現右側唾液腺腫大，24 小時後掃超音波發現有唾液腺管擴大和唾液腺發炎之情形。之後病人經非類固醇抗發炎藥物治療，兩週後症狀消失。病例二：一位 53 歲女性因腰椎脊椎滑脫接受第三到第五腰椎內固定手術，麻醉方式及手術姿勢與病例一相似，手術時間約 5 個小時，手術麻醉結束後發現右側唾液腺腫大，24 小時後掃超音波發現唾液腺有發炎之情形但並未有唾液腺管擴大情況。之後病人經非類固醇抗發炎藥物治療，十天後症狀消失並恢復。兩位病患在經保守治療後並未產生任何併發症和遺留下唾液腺腫大之後遺症。(長庚醫誌 2007;30:453-7)

關鍵詞：腮腺、麻醉、超音波

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