

SEIZURE AFTER LOCAL ANESTHESIA FOR NASOPHARYNGEAL ANGIOFIBROMA

Cheng-Jing Tsai,¹ Hsun-Mo Wang,² I-Chen Lu,¹ Chih-Feng Tai,^{2,3} Ling-Feng Wang,²
Lee-Ying Soo,¹ and David Vi Lu¹

Departments of ¹Anesthesiology and ²Otolaryngology, Kaohsiung Medical University Hospital, and ³Department of Otolaryngology, Faculty of Medicine, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan.

We report a young male patient who experienced seizure after local injection of 3 mL 2% lidocaine with epinephrine 1:200,000 around a recurrent nasal angiofibroma. After receiving 100% oxygen via mask and thiamylal sodium, the patient had no residual neurologic sequelae. Seizure immediately following the injection of local anesthetics in the nasal cavity is probably due to injection into venous or arterial circulation with retrograde flow to the brain circulation. Further imaging study or angiography should be done before head and neck surgeries, especially in such highly vascular neoplasm.

Key Words: local anesthesia, nasopharyngeal angiofibroma, seizure
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Nasopharyngeal angiofibroma is a rare (0.5% of head and neck tumors), highly vascular, histologically benign, and locally invasive neoplasm [1,2]. A less invasive therapy in the form of an intranasal endoscopic resection has become possible for small and extracranial tumors [2].

It is believed that the rate of toxic reactions is extremely low given that a large number of local anesthetics have been administered worldwide [3]. Although neurologic complications may occur as a result of local anesthesia, there have been no reported prior cases of complications due to local anesthesia administered during intranasal endoscopic surgery, particularly for a nasopharyngeal angiofibroma. We discuss the causes of the neurologic toxicity after the injection of small doses to the nasal cavity.

CASE PRESENTATION

A 25-year-old male patient, weighing 68 kg, had a recurrent nasopharyngeal angiofibroma. Tracing back this patient's medical history, he had received primary intranasal endoscopic resection for a nasopharyngeal angiofibroma in the left nasal cavity under general anesthesia. There was no specific finding in his medical history. In addition, the patient had not been taking any medication before the intranasal resection was performed. However, 2 months after the resection, a nasal tumor outside the left sphenoid sinus was found on endoscopic examination (Figure). Since the recurrent tumor was a small and well-defined lesion, an intranasal endoscopic resection with local anesthesia was arranged.

The patient was sent to the operating room and intranasal injection of 3 mL 2% lidocaine with epinephrine 1:200,000 was given around the tumor. During the injection, we reexamined whether blood or cerebrospinal fluid ran into the syringe using needle aspiration to prevent intravascular injection.

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Address correspondence and reprint requests to: Dr Chih-Feng Tai, Department of Otolaryngology, Kaohsiung Medical University Hospital, 100 Tzyou 1st Road, Kaohsiung 807, Taiwan.
E-mail: c8501085@yahoo.com.tw

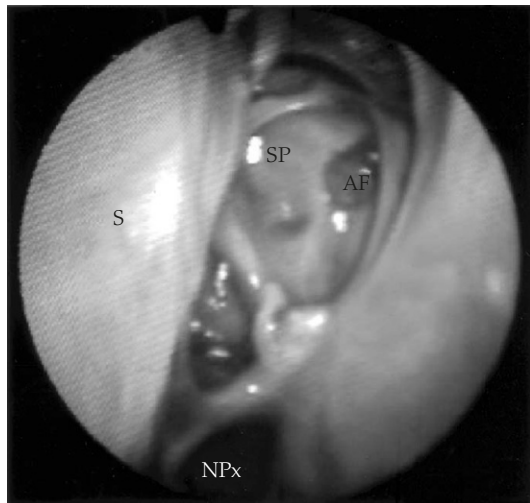


Figure. Endoscopic appearance of the recurrent small angiofibroma in the left nasal cavity. S=nasal septum; SP=sphenoid sinus; AF=angiofibroma; NPx=nasopharyngeal wall.

Ten seconds after the injection, the patient became unresponsive. He experienced a seizure lasting for 2 minutes, with apnea and cyanosis of lips. Throughout the period of apnea, the patient's ventilation was supported by bag and mask with 100% oxygen with the help of an anesthesiologist. The seizure was treated with thiamylal sodium (125 mg). After 20 minutes, the patient regained consciousness, began spontaneous breathing, and was able to follow doctor's instructions. His blood pressure was 146/83 mmHg, and heart rate was 107 bpm. General neurologic examinations showed no further abnormalities. Two days after the incident, the patient without other physical complications and sequelae was discharged from the hospital.

DISCUSSION

Nasopharyngeal angiofibroma is a rare benign tumor that often has high-flow arteriovenous fistula. It has also been known that types of tumors can be classified as either extracranial or intracranial extension. Intracranial extension may spread through the sphenoid sinus into the cavernous sinus [2]. Endoscopic treatment for a small size, early-stage, and well-embolized nasopharyngeal angiofibroma could be beneficial [2,4]. To improve the patient's comfort and to decrease potential risks of general anesthesia,

we performed the endoscopic resection under local anesthesia.

The systemic adverse consequences of local anesthesia ranging from therapeutic to toxic can best be described as a continuum that depends on blood level concentration [3]. The main toxic effect occurs in the central nervous system (CNS) and cardiovascular system. The continuum of symptoms associated with CNS toxicity is related not only to the concentration of local anesthetic, but also to the rate at which the concentration is presented to the nervous system. Lidocaine is the most commonly used local anesthetic because of its inherent potency, rapid onset, and moderate duration of action. The maximum safe dose of submucosal lidocaine is 4.5 mg/kg or 7 mg/kg (with epinephrine). Low concentrations of lidocaine provide effective treatment for some types of ventricular arrhythmias (intravenous injection, 1–1.5 mg/kg; maximum dose, 3 mg/kg) [5]. Signs of CNS toxicity follow abrupt injections of small doses of local anesthetic in the head and neck [6]. Sreenivasa et al [7] presented four cases of convulsion and respiratory arrest associated with retrobulbar injection in ophthalmic surgeries. Case reports have documented unexpected convulsion and death in healthy adults receiving routine intraoral injection with low-dose local anesthetic and peribulbar blocks [6–8]. From the review of the literature, the acute onset of the seizure without the patient complaining of a metallic taste in the mouth and in the absence of cardiovascular collapse indicates the rapid elevating concentration in the brain circulation [6–8]. Local anesthetic injection to the head and neck reaching the brain circulation could be due to the retrograde flow toward the brain circulation [9]. In the present case of recurrent nasal angiofibroma, the anatomy and vascularity around the recurrent lesion might have changed since the first operation. In addition, the nasopharyngeal angiofibroma has the potency of local invasion [2]. Seizure immediately following the injection of local anesthetic in the nasal cavity is probably due to injection into venous or arterial circulation with retrograde flow to the brain circulation.

The complication, even though it has a low incidence and is self-limiting, can result in serious or fatal consequences if not recognized early and treated properly. Instantaneous establishment of a secured airway is desirable for CNS intoxication. Increase in carbonic dioxide production, oxygen consumption, hypoxia, and acidosis aggravates CNS toxicity [3].

The immediate management of this type of emergency should be addressed and attended considering both the convulsion and the respiratory depression. Overall, it is believed that airway maintenance, assisted ventilation, and control of convulsion are important factors for such a circumstance.

This case emphasizes that further imaging study or angiography should be done before the surgery, especially in such a highly vascular neoplasm. Local anesthetic techniques have to be applied very carefully and appropriate monitoring of the patient is necessary.

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鼻腔血管纖維瘤復發的病人接受局部麻醉後產生癲 — 病例報告

蔡承靜¹ 王遜模² 盧奕丞¹ 戴志峰^{2,3}

王凌峰² 蘇理盈¹ 盧偉¹

高雄醫學大學附設醫院 ¹麻醉科 ²耳鼻喉科

³高雄醫學大學 醫學院醫學系 耳鼻喉學科

一名 26 歲男性，罹患復發之鼻腔血管纖維瘤，於鼻腔內注射 3 毫升局部麻醉劑 lidocaine 後，產生癲癇，在給予氧氣與注射 thiamylal 後，病人完全恢復且無殘留其他神經症狀。頭頸部手術注射局部麻醉時，急速產生之癲癇可能是由於藥物經靜脈或動脈回流至腦部循環中所造成。因此在處理此類血管豐富的頭頸部腫瘤時，應安排術前的血管攝影或影像學檢查。

關鍵詞：鼻腔血管纖維瘤，局部麻醉，癲癇

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高雄醫學大學附設醫院耳鼻喉科

高雄市807三民區自由一路100號