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Mandible Swing Approach for Excision of Tumors from Parapharyngeal Space

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Abstract

Five cases of resection of pharyngeal and parapharyngeal space (pps) tumors show that mandible swing approach is an optimal option for thoroughly removing retromandibular tumors of the parotid. The excisions do not injure the seventh nerve or cause any complications. In all the five cases, tumors are located at parapharyngeal space, while in one of the five cases, the tumor protrudes to the palate.

Keywords: Mandible swing, Parapharyngeal space (pps), Tumor resection, Surgery approach

Incidence of tumor in parapharyngeal space is low, accounting for less than 0.5% of head and neck neoplasms (Cai, et al., 1998). Various approaches have been employed in the world to thoroughly resect the pharyngeal and parapharyngeal space tumors. The mandible is the major barrier for surgeons to have full access to the pharyngeal and parapharyngeal space. Many scholars applied mandible swing approach to resect the parapharyngeal space tumors and cranial base tumors (Cai, et al., 1998; Wang, et al., 1998; Han, et al., 2002), using the same method, we successfully resected five cases of parapharyngeal space tumors from 2000 to 2006.

1. Clinic information and method

1.1 Clinic information

Using the mandible swing approach, researchers resected the parapharyngeal space tumors of five patients (three men and two women) who were aged 27 to 55 years old. Three tumors were on the left and two on the right. The largest tumor was 8cm×6cm×5cm, and the smallest one was 3cm×3cm×1.5cm. There were one sponge-like angioma, three pleomorphic adenomas and one basal cell adenoma. The largest one protruded to the palate and influenced breath and deglutition of the patient, and other tumors gave rise to a feeling of eyewinker, deglutition disorder, and snoring.

1.2 Therapy method

Five patients received a standard preoperative examination and preoperative three-dimensional imaging of spiral CT. The pathological position was located and the operation plan and approach were determined.

General anesthesia was done by endotracheal intubation via nose. Patient lay in a supine position, with the head turning to the other side. "S" shape incision of standard parotid gland operation was performed, from the position two centimeters down the mandible to the surface of hyoid. The dermis, platysma were separated to expose the submandibular triangle. The hypoglossal nerve and facial artery was protected, the upward external carotid artery were separated and exposed, and the external carotid artery between glossal artery and the start of superior thyroid artery was ligated. Full lower lip was longitudinally cut from the middle, and the incision was joined with the former incision like an arch. Two and a half centimeters chin periosteum was turned toward the affected side, the mental nerve was carefully protected, after boring on the two sides of cut for the following fixation of splint, the mandible was sawed between incisor and canine tooth on the affected side. The tongue was drawn to the intact side; the mouth floor mucosa was cut along the inner side of mandible until the glossal palatine arch and the glossal nerve was protected. Mylohyoid muscle

was cut from the posterior to the anterior until the midline, and then the mandible was swung outside to thoroughly expose the pharyngeal and parapharyngeal space (Figure 1, Figure 2, Figure 3, and Figure 4). The tumor was separated via blunt dissection along the envelope, and extirpated completely. The blood was thoroughly stanched and the mandible was reposited and fixed with titanium mini-plate. The mouth floor mucosa, mylohyoid muscle and lower lip were sewed up; negative pressure drainage was used and the cut was sewed up step by step.

2. Results

All the mandibles were sawed between tooth 2 and tooth 3, and tumors were completely extirpated with naked eye by mandible swing approach. Nose feeding was done for ten days, and the cut healed by first intention. Within one to three years after the operation, patients had short-term mouth opening and closing disorders and speaking problems. But patients' lives were brought to normal by sufficient focused training and no complications appeared. In none of the five cases was trachea incision was performed or breathing disorder was found.

3. Discussion

3.1 The anatomical characteristic of pharyngeal and parapharyngeal space

Pharyngeal is a crateriform muscle pipeline from the bottom of skull to the sixth neck vertebrae, and the back and exterior side of pharyngeal is called parapharyngeal space, which looks like a filler and is also named as danger space. Parapharyngeal space lies adjacent to the lateral wall of pharyngeal, medial pterygoid muscle and parotid gland envelope, the back side is pre-vertebral fascia, and the upside is pterygopalatine space, it indirectly connects to skull base, and its exterior side connects to parotid gland recess. Tumors of parotid gland can directly get to the space and transfer to the lymph node, so when incising the tumor and lymph node in the space, one should pay attention to the misshapen blood vessel and neural tissue. It is reported that the incidence of tumor in parapharyngeal space is low, but it shows a trend of increase in recent years. Mixed tumor in parotid deep lobe and minor salivary gland is common, and tumors in nose and pharyngeal often affect the parapharyngeal space (Han, et al., 2002; Yu and Ma, 1988).

3.2 The clinic characteristic of tumor in parapharyngeal space

It is reported that tumor in parotid deep lobe accounts for 12.8% of the parotid gland tumor (Yu and Ma, 1988) and 2.6% of the parotid gland tumors will transfer to the pharyngeal, parapharyngeal, palate and skull base (Sun, et al., 2006). In this report, the adenoma in the parapharyngeal space accounted for 3.7% of parotid gland tumor. Generally, there was no obvious symptom in the beginning, the patients usually felt uncomfortable in their pharynxes and had a feeling of eyewinker, they would snore when lying, and their voice was obscure, it was uncomfortable to swallow, but it didn't hurt much. One patient felt pain because of infection, but the hurt disappeared after receiving anti-inflammation treatment. After operation, it was indicated that there was three pleomorphic adenomas, one sponge-like angioma and one basal cell adenoma.

3.3 A comparison of different approaches to resect the pharyngeal and parapharyngeal tumors

Operation is an effective method to cure pharyngeal and parapharyngeal tumors, and there are various operative approaches as follows (Cai, et al., 1998; Wang, et al., 1998; Han, et al., 2002; Yu and Ma, 1988; Sun, et al., 2006). The first is the oral approach. Its weaknesses are that the operative space is small and that the important blood vessel and tumor can not be clearly exposed. Plus, the tumor can be broken easily and the large blood vessel might be accidentally injured. The second is lateral neck dissection approach which could injure important structures due to insufficient exposure of the parapharyngeal space. The third is the neck-parotid approach, which will lead to peripheral facial paralysis and facial malformation. The fourth is lateral-neck-postotic approach. It is appropriate for large tumor that intrudes to the skull base, but it can not completely expose the structure of skull base. Comparatively speaking, the mandible swing approach in question can thoroughly expose the important blood vessels in the upper neck and the structure of skull base. It can also clearly exhibit the tumor in the pharyngeal and parapharyngeal space, so that operation could be performed in an open visual field. It becomes easier to resect the tumor thoroughly and clear the lympha node behind the pharyngeal; in addition, it is easier to thoroughly resect the glomangioma. Our conclusion is that mandible swing approach is ideal for the resection of pharyngeal and parapharyngeal tumors (Han, et al., 2002; Sun, et al., 2006). In our case report, all the five patients received spiral CT and other standard preoperative examinations. General anesthesia was given by endotracheal intubation via nose, so the trachea was not incised. After wakeup, patient received aerosol inhalation two to three times every day. And no complication such as dyspnea was found. It should be noticed that mandible swing approach could lead to incomplete concrescence of mandible, and patient might have the following complications: inarticulacy, deglutition obstacle, middle ear effusion and bleeding, and cranial nerve palsy (Wang, et al., 1998). The mandible swing approach could make successful operations. Blind and unnecessary injuries could be avoided. But it requires that the operators be familiar with the anatomical structure and try to preserve the parenchyma around the chin so as to reduce complications.

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Figure 1. Design of incision

Figure 2. Mandible swing

Figure 3. Resection of tumor

Figure 4. Fixed mandible by mini-plate