Hypoglossal nerve palsy following the robotic thyroidectomy for the papillary thyroid carcinoma: A case report

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1. Introduction

Recently the endoscopic surgical techniques with robotic system in the thyroid cancer have been reported to show good results and advantages; however the risk of these techniques has not been fully documented. The risk of these techniques involving the adjacent structure such as parathyroid glands, recurrent laryngeal nerves, and superior and inferior thyroid vessels, has not been fully documented. We will describe an unusual neurological complication of hypoglossal nerve palsy after endoscopic thyroidectomy combined with robotic systems.

2. Case report

A 20-year-old woman presented with tongue deviation, speech disturbance and swallowing difficulty following the robotic systems assisted thyroidectomy. Previously, she had had an about 7 mm sized, poor enhancing and well-defined thyroid nodules by neck computer tomography (CT) (Fig. 1A and B). Thyroid fine needle aspiration (FNA) cytology had confirmed the papillary thyroid carcinoma, followed by an endoscopic thyroid lobectomy with central lymph node dissection by using a robotic system.

During the operation, the patient was placed on the operative table in supine position under the endotracheal intubated and general anesthesia. Skin incision was made above the suprasternal notch and the sternothyroid and sternocleidomastoid muscle was retracted to each side laterally for the exposure of thyroid gland, and to conclude the thyroid carcinoma was successfully removed by using a robotic system. However, she complained of the tongue deviation to the left side, speech disturbance and swallowing difficulty coinciding with hypoglossal nerve palsy after thyroidectomy (Fig 1C). Therefore we checked the nerve conduction study (NCS) to confirm the hypoglossal nerve injury. Both hypoglossal NCSs were performed on all subjects using a standard published technique [5,6]. Both a recording and a reference electrode, positioned 2 cm apart on a tongue blade, were placed on the dorsal surface of the hemi-tongue, over intrinsic tongue muscles. A ground electrode was placed on the cheek. Bipolar percutaneous stimulation using 0.02 ms duration, 100 mA electrical stimulus was applied along the base of the mandible, with pressure applied to the stimulator. The duration of the electrical stimulus was gradually increased until a supramaximal compound muscle action potential (CMAP) wave form was achieved. The result of NCS revealed that the wave form of left hypoglossal nerve was not recorded, whereas the amplitude

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and latency of right hypoglossal nerve were normal by published normal values [5].

As a result, our patient was diagnosed as left hypoglossal nerve palsy which was iatrogenic complication resulted from the endoscopic thyroidectomy with using robotic system. We carefully observed the changes of symptoms for 6 months, and her speech and swallowing slightly improved, however the tongue deviation sustained without remarkable improvement.

3. Discussion

To our knowledge, the hypoglossal nerve palsy after endoscopic thyroidectomy with using robotic system has not been reported yet. Previously, a few complicated cases of hypoglossal nerve injury have been documented involving iatrogenic cases from traction or dissection around the hypoglossal nerve during laryngeal surgery, cervical spine surgery, carotid endarterectomy or laryngeal mask [5,7,8]. And hypoglossal nerve palsy presented with clinical symptoms with deviation of the tongue to the same side of injury, tongue biting, swallowing difficulty, tongue atrophy and dysarthria [5,7,8]. However, because the anatomical pathway of the hypoglossal nerve does not run directly through the thyroid tissue, the hypoglossal nerve palsy after endoscopic thyroidectomy is extremely unusual [7,8].

In our case, a few etiologies could be suggested for the development of hypoglossal nerve palsy. First of all, a thyroid cancer of the patient was extended to superior pole adjacent to the hyoid bone level where the hypoglossal nerve runs closely and vulnerable to the compression, therefore, it might be associated with mechanical stretching or entrapment of hypoglossal nerve during tumor resection. However such cases have been very rare due to anatomical distance. Next, the hypoglossal nerve palsy of our patient might be associated with anesthetic procedures including the forceful placement of the laryngoscope on the lateral tongue base, hyperextension of the head, cricoid pressure, tight oropharyngeal packs, and hyperinflation of the laryngeal mask airway [8]. Finally, the continuous compression of some causes might disrupt the intraneural connective tissue and inhibit the intraneural blood circulation resulting in axonal damage.

Nevertheless, unfortunately we cannot confirm the definite etiology of hypoglossal nerve palsy in this case. And we did not explore the area to repair the hypoglossal nerve injury, because our patient wanted to observe the clinical progress without repair, and previous most cases have reported that iatrogenic hypoglossal nerve palsy showed the good improvement [5,7,8].

In conclusion, we experienced a 20-year-old woman with hypoglossal nerve palsy after performing robotic thyroidectomy, and this complicated case shows that although the robotic surgery is a creative technique and has been known to be safe and effective, the risk of this surgery including hypoglossal nerve palsy should be taken into account before surgery.

Conflict of interest

There are no conflicts of interest. The authors report no disclosures.

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Ethical approval

Ethical Committee of the Chung-Ang University Hospital.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Authors’ contributions

Suk-Won Ahn: concept, writing the paper, submission etc.

Kyung Ho Kang: review of the paper, surgical intervention.

Guarantor

Suk-Won Ahn.

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