## AB021. Prevention of recurrent laryngeal nerve injury with intraoperative nerve monitoring during esophageal cancer surgery—CCH experience

## Wei-Heng Hung, Ching-Yuan Cheng, Chang-Lun Huang

Division of Thoracic Surgery, Department of Surgery, Changhua Christian Hospital, Changhua, Taiwan

**Background:** Recurrent laryngeal nerve (RLN) injury is a common complication after esophagectomy. It might have decreased cough effort and pulmonary hygiene even increased the risk of aspiration. RLN injury often occurred while RLN lymph node dissection or neck exploration. Our purpose is to investigate the role and efficacy of intraoperative RLN monitoring in esophageal cancer surgery.

**Methods:** The Medtronic NIM<sup>®</sup> Nerve Monitoring System is an electromyographic (EMG) monitor for intraoperative use, mostly in head and neck surgery. Our patients were intubated with the Medtronic NIM TriVantage<sup>TM</sup> EMG Endotracheal Tube 8.0mm which have two exploratory electrodes above the cuff. The electrodes are connected to the NIM Nerve Monitoring System, which continuously monitors EMG activity from vocal cords innervated by the RLN. When the nerve has been activated or stimulated, the NIM System warns to help minimize trauma to the nerve. About 30 minutes before RLN lymph node dissection, we held muscle relaxant which could decrease the sensitivity of the monitoring system. We routinely detected the RLN with the probe (nerve stimulator) three times during surgery. The stimulation level was set at 3.0 mA as a starting point and the event threshold at 100  $\mu$ V. First time we detected RLN before identified RLN. After RLN was identified and RLN lymph node was dissected, we detected RLN second time to confirm whether RLN injury or not. We detected the RLN third time after cervical lymph node dissection. We routinely checked vocal cords function on postoperative 6<sup>th</sup> or 7<sup>th</sup> day.

**Results:** We used this method in total 5 patients. One of our patient was unilateral vocal cord paralysis before our surgery due to previous hypopharyngeal caner post radiotherapy. In this case we still identified the RLN but the monitor could not detect RLN due to nerve injury previously. 4 Patients underwent Mckeown esophagectomy and one underwent Ivor-Lewis esophagectomy. One of our patient had underdone robotic esophagectomy and the other 4 cases had underdone traditional minimal invasive esophagectomy. Temporary voice change occurred without direct nerve transection in one of our patients. In this case, RLN was identified and detected initially but poor response to monitoring system after RLN lymph node dissection, suspect nerve stretch related injury.

**Conclusions:** Intraoperative RLN monitoring could assist to detect the RLN route and avoid direct nerve injury while RLN lymph node dissection. It is a helpful method to identified RLN especially for inexperience surgeon or dense adhesion tissue around RLN.

**Keywords:** Recurrent laryngeal nerve (RLN); intraoperative nerve monitoring; esophageal cancer

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