

Sangkyu JIN, Jiyeon KIM and Il-Woo SHIN

Department of Anesthesiology and Pain Medicine, Gyeongsang National University Hospital, Jinju, Korea

## BACKGROUND

Carotid artery rupture during head and neck surgery is a catastrophic, life-threatening emergency. Although recent incidence has declined, it still occurs in many patients. Hemorrhage from the carotid artery is usually massive and uncontrollable. Fast, aggressive treatment to prevent hemodynamic instability is required. Even if patients survive this event, they may experience severe neurological sequelae. A ruptured carotid artery is usually controlled by direct compression and arterial ligation. However, apart from the inherent difficulty of operating, these traditional surgical treatments are associated with high morbidity and mortality.

## CASE REPORT

A 31-year-old male who was 171 cm tall and weighed 85 kg was diagnosed with thyroid cancer 4 years prior, and underwent a total thyroidectomy with modified radical lymph node dissection of the neck. During outpatient treatment after the surgery, a 3.3-cm sized cystic lesion was found at the right supraclavicular area. To rule out metastatic lymph node disease, lymph node excision was planned under general anesthesia.

After dissection, metastatic lymph node invasion of the right common carotid artery (CCA) was confirmed. During careful dissection, the CCA ruptured unexpectedly and massive arterial spurting occurred. For bleeding control, the surgeons applied direct manual compression with the hand.

Several attempts to directly repair the ruptured CCA failed, we concluded that endovascular management was a better choice to enhance the patient's safety. The anesthesiologists and surgeons moved the patient to the interventional radiology suite about 300 meters from the operating room while compressing the ruptured CCA.

Extravasation of the contrast agent from the right proximal CCA occurred within the neck (Fig. 1). Along the guide wire, covered stent was inserted into the right proximal CCA (Fig. 2). There was massive bleeding during intermittent release of CCA compression, which was done to check the results of the procedure.

After procedure, the distal flow to the CCA and subclavian artery was well maintained. The patient was transferred to the operating room again, the surgery was completed.

The patient was transferred to the surgical intensive care unit (SICU) with norepinephrine administered at 0.05 mcg/kg/min via continuous infusion. The patient's vital signs at the SICU were stable. He was shifted to the medical ward one day later and discharged eight days after the surgery. No specific findings were observed during the postoperative brain work-up.



Fig.1

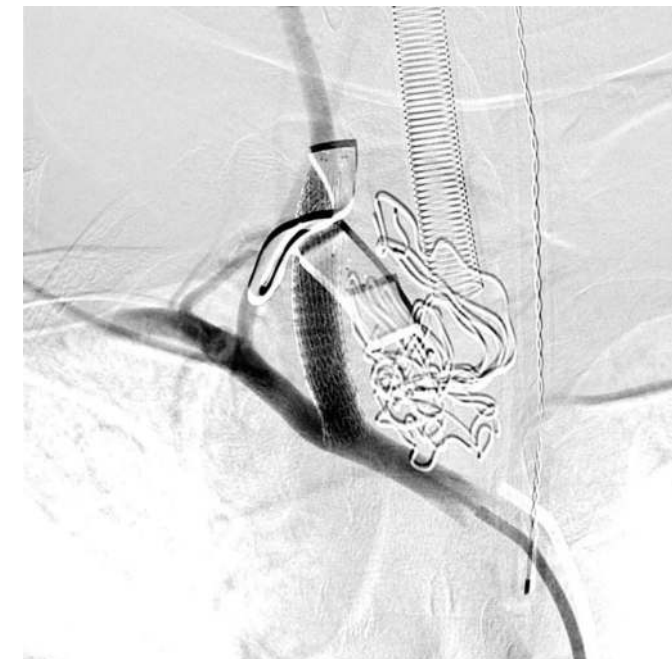


Fig.2



Fig.3

## DISCUSSION

In this case, we did not anticipate the rupture, despite various risk factors, including the previous neck dissection history and vessel involvement of cancer. However, multidisciplinary team led by anesthesiologists responded rapidly to a hemodynamic crisis. Therefore, the patient could undergo surgery without any complication. Clinicians need to be mindful of the importance of a team-oriented collaboration.

Although endovascular management is still associated with complications such as stent occlusion, stent infection, and brain abscess due to the placement of foreign bodies, it can reduce morbidity and mortality.

## REFERENCES

1. Citardi MJ, Chaloupka JC, Son TH, Ariyan S, Sasaki CT. Management of carotid artery rupture by monitored endovascular therapeutic occlusion (1988-1994). *The Laryngoscope* 1995; 105: 1086-92
2. Vecchia C, Malvezzi M, Bosetti C, Garavello W, Bertuccio P, Levi F, et al. Thyroid cancer mortality and incidence: a global overview. *International journal of cancer* 2015; 136:2187-95
3. Haas RA, Ahn SH. Interventional Management of Head and Neck Emergencies: Carotid Blowout. *Seminars in Interventional Radiology* 2013; 30: 245-8.

## LEARNING POINTS

When major vascular damage occurs, anesthesiologists must be aware that the use of interventional radiology is an option when severe major vessel or organ injury occurs in the perioperative period. This has enabled us to reduce the risk of life-threatening hemorrhage and a devastating complication, such as cerebral infarct.