Preoperative Computed Tomographic Angiography for Complicated Head and Neck Reconstructions

Jung-Hsing Yen MD, Yen-Wei Chen MD, Wen-Hsien Chen MD

Introduction: Reconstruction of complicated head and neck of after multiple operations and radiation therapies continue to be a challenge for plastic surgeons. It not only affects the anatomy due to considerable adhesions of fibrotic tissues, but also can lead to endothelial dysfunction, pronounced fibrosis and decreased vascularization pattern. We utilize the multi-detector computed tomography angiography (CTA) for preoperative evaluation to detect reliable vessels for anastomosis. Surgical options would be considered whether to abort, to proceed on using free flaps or altered local flaps for reconstruction.

Methods: Based on retrospective review of our experiences for complicated of head and neck tumor resection from 2011 to 2015, the preoperative neck vessels were evaluated by CTA. The findings were divided into three groups: Group I, Present recipient vessels; Group II, Present recipient vessels with small or stenosis vessels; Group III, No recipient vessels.
The preoperative surgical planning was made according to the reports of CTA.

Results: Total of 28 patients ranging from 42 to 74 years old (average, 58) and previous operation frequency from 1 to 8(average, 2.2) were evaluated. In 23 patients, peri-operation radiotherapy was performed. In CTA reports, Group I, 7 patients have received free flap(free ALT flap: 5, free fibula flap: 2). All free flaps survive without partial loss. Group II, there are 6 free flaps(free forearm flap: 1, free ALT flap: 5), 5 local flaps(PMMC flap: 4, PMMC + DP flap: 1) and one without surgery. Group III, 5 patients received local flaps(PMMC flap: 2, DP flap: 1, PMMC + DP flap: 2) and four patient without surgery. A treatment algorithm was developed.

Conclusions: MDCT angiography provides high-resolution, three dimensional vascular imaging for preoperative surgical planning to evaluate reliable vessels for anastomoses. The use of CTA should be considered for difficult microsurgical reconstructions in head and neck. When an abnormality in vascular anatomy is detected by CTA, the surgeon is advised to consider altering the operative plan accordingly. In addition, CTA indeed increases the surgical confidences of preoperative planning, increases the successful rate of difficult reconstructions in head and neck and diminishes the patient's discomforts.

Disclosures: The authors have nothing to disclosure and have no financial interest in any of the products or devices mentioned in this manuscript.