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Case Report

Usefulness of computed tomography aortography and dye infusion in confirming the feeding arteries for effective treatment of a large squamous cell carcinoma of the lower lip with a single intra-arterial infusion chemotherapy combined with radiotherapy ☆,☆☆

Shota Ueda, MD, PhD*, Tetsuo Sonomura, MD, PhD, Ryuta Okuhira, MD, Ryosuke Mimura, MD, Akihiko Kumamoto, MD, Hiroki Minamiguchi, MD, PhD

Department of Radiology, Wakayama Medical University, Wakayama, Japan

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ABSTRACT

A 73-year-old male presented with a lower lip squamous cell carcinoma (SCC) (23 mm in diameter). Systemic imaging, including computed tomography (CT) and positron emission tomography, showed no evidence of distant metastasis. Due to the large size of the tumor, reconstruction after surgical tumor removal was considered to be difficult. Therefore, we decided to initially perform intra-arterial chemotherapy. Under local anesthesia, a catheter was inserted via the femoral artery. CT aortography from the ascending aorta was performed to visualize the precise vascular anatomy. The tumor's feeding arteries were confirmed by injecting indigo carmine dye through the catheter. Then, 87.5 mg of cisplatin was selectively injected through the left and right facial arteries (total dose of 175 mg). The tumor significantly shrank and almost disappeared 1 month after chemotherapy. Although additional intra-arterial chemotherapy was considered, the risks associated with the procedure meant that radiotherapy was performed instead. There were no signs of recurrence at the 2-year follow-up. In this patient, a single intra-arterial infusion chemotherapy combined with radiotherapy achieved complete disappearance of a large SCC of the lower lip. This treatment strategy allowed us to preserve the functional and cosmetic aspects of the patient's lower lip with minimal side effects. CT aortography and dye infusion were important in confirming the tumor's feeding arteries.

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* Corresponding author.

E-mail address: uedaaa@wakayama-med.ac.jp (S. Ueda).

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Introduction

Surgical treatment is often chosen for the treatment of lip cancers. However, functional issues such as eating and speaking disorders can arise after surgery, and the patient's quality of life can decline. Cosmetic problems can also occur. Therefore, treatment strategies that consider functional and cosmetic aspects are required. One such strategy is intra-arterial infusion chemotherapy. Robbins et al. [1] first reported super-selective intra-arterial chemoradiotherapy (RADPLAT) for head and neck cancers. Since then, RADPLAT has also been performed in Japan for the treatment of localized advanced oral cancers. However, there are few comprehensive reports on intra-arterial infusion chemotherapy for lip cancers. Most reports of intra-arterial drugs involved the use of methotrexate and peplomycin sulfate, and there are few reports of cisplatin [2–6]. We report a case in which single intra-arterial infusion chemotherapy with cisplatin combined with radiotherapy led to the complete disappearance of a large squamous cell carcinoma (SCC) of the lower lip.

Case report

A 73-year-old male presented with SCC of the lower lip (23 mm in diameter) (Fig. 1). Systemic imaging, including computed tomography (CT) and positron emission tomography, showed no evidence of distant metastasis. Owing to the large size of the tumor, reconstruction after tumor removal was considered to be difficult. Therefore, we decided to initially perform intra-arterial chemotherapy. Under local anesthesia, a 6 Fr. short sheath (Terumo, Tokyo, Japan) was inserted through the femoral artery. CT aortography from the ascending aorta using a 4 Fr pigtail catheter (Medikit, Tokyo, Japan) was performed to visualize the precise vascular anatomy of the face (Fig. 2). Both facial arteries were identified as feeding arteries. Using a 0.035 inch guidewire (Piolax, Yokohama, Japan), a 4 Fr JB2 catheter (Medikit) was inserted into the external carotid artery, followed by a 6 Fr guiding catheter (ENVOY;



Fig. 1 – Squamous cell carcinoma (23 mm in diameter) on the patient's lower lip.

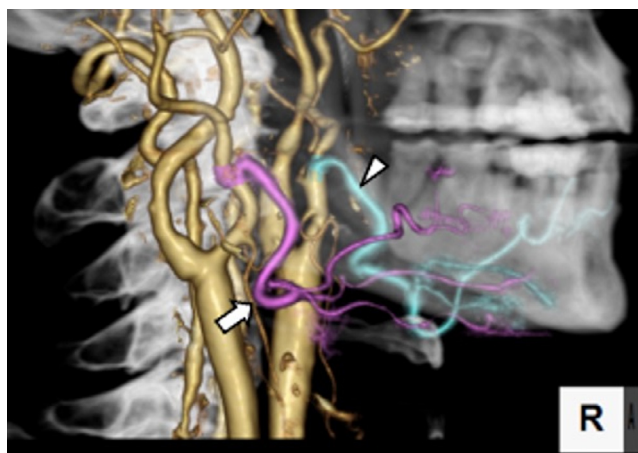


Fig. 2 – Volume-rendered image created from computed tomography aortography shows the right facial artery (arrow, pink color) and the left facial artery (arrowhead, light blue color) feed the tumor.

Johnson & Johnson, Tokyo, Japan). A 1.7/2.8 Fr microcatheter (Veloute; Asahi Intecc, Aichi, Japan) was then inserted into both facial arteries using a 0.014 inch microguidewire (CHIKAI V; Asahi Intecc, Aichi, Japan). Arteriography of both facial arteries showed tumor staining in the lower lip (Fig. 3). Drug distribution was confirmed by injecting indigo carmine dye through the catheter (Fig. 4). Then, 87.5 mg of cisplatin was selectively injected through the left and right facial arteries (total dose of 175 mg; 100 mg/m²). The tumor significantly shrank and almost disappeared 1 month after chemotherapy. Although additional intra-arterial chemotherapy was considered, the risks associated with the procedure were considered to be too high and radiotherapy was performed instead. There were no signs of recurrence at the 2-year follow-up (Fig. 5).

Discussion

Although there are several reports describing intra-arterial infusion chemotherapy for the treatment of lip cancer, few have involved chemotherapy using cisplatin [2–6]. In those reports, cisplatin was infused through the superficial temporal artery and repeated over several cycles. For head and neck cancers, Robbins et al. proposed RADPLAT, whereby chemotherapy is infused through the femoral artery using the Seldinger technique [1]. RADPLAT involves 4 sessions of intra-arterial infusion chemotherapy using cisplatin at a dose of 150 mg/m² once a week with simultaneous radiotherapy. In a Japanese clinical trial of patients with localized advanced maxillary sinus cancer, a single dose of cisplatin was injected at a dose of 100 mg/m² [7]. In the current case, after consultation with a dermatologist, we selected intra-arterial infusion chemotherapy using cisplatin with a dose of 100 mg/m². Sodium thio-sulfate was intravenously administered simultaneously to the intra-arterial infusion to neutralize the systemic effects of cisplatin. There were no side effects related to cisplatin.



Fig. 3 – Angiography. Facial arteriography of the right (A) and left (B) facial arteries showing tumor staining (arrows) in the lower lip.

The femoral artery approach with the Seldinger technique carries the risk of stroke, one of the serious adverse events associated with the procedure. In prior studies, the occurrence rate of stroke (grade ≥ 2) was reported to be 1.6%–8.2% [7–11]. Our patient experienced no adverse events due to the catheter procedure. We believe that administering a single intra-arterial infusion chemotherapy could reduce the ad-

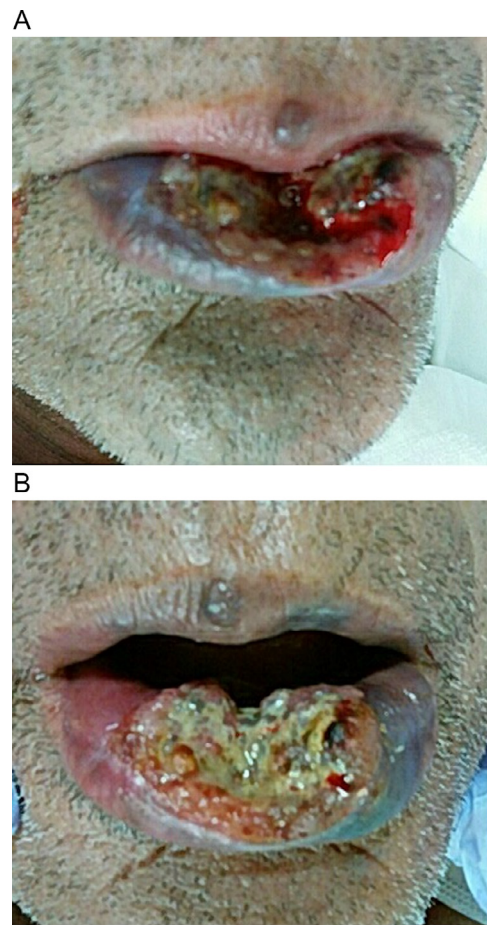


Fig. 4 – Photographs taken after indigo carmine dye infusion. (A) The right side of the lower lip was stained blue following dye infusion through the right facial artery. (B) The left side of the lower lip was stained blue following dye infusion through the left facial artery.

verse events associated with the procedure. In addition, the adverse effects associated with radiotherapy could be alleviated by reducing the tumor size with chemotherapy compared with performing radiotherapy alone. In patients with a large



Fig. 5 – Course of treatment. Photographs obtained 1 week after chemotherapy (A), 2 weeks after chemotherapy (B), 1 month after chemotherapy (C), and after radiotherapy (D). The tumor completely disappeared after a single intra-arterial infusion of chemotherapy combined with radiotherapy.

tumor, this combination treatment offers functional and cosmetic advantages over surgery.

In our patient, CT aortography and arterial injection of indigo carmine dye were performed to accurately identify the tumor's feeding arteries, which enabled safe and effective treatment. Selective CT arteriography is also effective, but artifacts caused by metal in the mouth can be problematic. Even if the tumor is not very large, it may be fed by the contralateral artery. Therefore, a combination of intra-arterial dye injection, angiography, and CT arteriography is required to determine the tumor's feeding arteries.

Conclusion

A single intra-arterial infusion chemotherapy combined with radiotherapy achieved complete disappearance of a large SCC of the lower lip. This treatment allowed us to preserve the functional and cosmetic aspects of the patient's lower lip with minimal side effects. CT aortography and dye infusion were important in confirming the tumor's feeding arteries.

Patient consent

The patient provided informed consent for preparation and publication of this case report.

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