
Frequently Asked Questions

What should I do if the microcatheter will not enter the transverse facial artery?

This is a blood vessel that many IVRists have trouble with. Detailed information is provided on the relevant page, which it is recommended you read carefully.

The key points are to know the direction of the origin of the transverse facial artery in advance, to correctly identify the internal maxillary artery and superficial temporal artery in the frontal-oblique position, to use a road map, to eliminate the pulsation effect on the microcatheter, and to ensure that the tip shaping of the microguidewire is properly done.

How often does a stroke occur?

The frequency of neurological complications in cerebral angiography has been reported to be 0.55-4%. The frequency of occurrence of new ischemic lesions detected by MRI diffusion-weighted imaging after cerebral angiography has been reported to be 0-30%. These were studies that focused exclusively on internal carotid artery imaging, so theoretically the frequency should be lower for IA infusion chemotherapy performed with a catheter in the external carotid artery.

Although there is no comprehensive report on this subject, at the authors' institution, the frequency of abnormal signals on diffusion-weighted images was 0.35%, the frequency of cerebral infarction with transient neurological symptoms was 0.11%, and that with permanent neurological symptoms was 0% in a 20-year aggregate.

The greatest risk of cerebral infarction in IA infusion chemotherapy occurs when the parent catheter is raised to the carotid artery in patients with severe sclerotic changes. If a difficult procedure is anticipated, systemic heparinization should be performed without hesitation. The common procedure seen at facilities where cerebral infarction has occurred is that the guidewire is manipulated very forcefully in the carotid artery without paying attention to the wall irregularity or plaque formation at the origin of the internal carotid artery, and without using a roadmap.

Even after the catheter is placed in the external carotid artery, do not overlook the presence of "dangerous anastomosis," a continuous pathway from the external carotid artery to the internal carotid artery or the vertebrobasilar artery.

Should Lipiodol TACE be done for head and neck cancer?

There are good reasons why Lipiodol TACE (Trans-Arterial Chemoembolization) for HCC (Hepatocellular Carcinoma) has been so widely used in Japan, but has not been adapted to head and neck cancer:

1. The key drug for locally advanced head and neck cancer is still cisplatin (there is no regimen better than CDDP alone).
2. Cisplatin is highly concentration-dependent and overcomes the tumor's drug resistance at high concentrations. TACE allows prolonged drug residence in the tumor but does not achieve the high concentrations needed for curative therapy.
3. TACE stops the tumor's feeding arteries, causing a hypoxic condition. While effective as a stand-alone treatment, it significantly reduces the effectiveness of radiotherapy.

For these reasons, TACE is considered to be incompatible with cisplatin and radiotherapy.

What about B-TACE for head and neck cancer?

B-TACE (balloon-occluded trans-arterial chemoembolization) is characterized by peripheral pressure gradient control using dual vascular control unique to the liver and peribiliary vascular plexus, and cannot be directly applied to the head and neck region, which does not have similar structures. Peripheral perfusion pressure will simply decrease under the blood flow control of external carotid artery, and control around the tumor margins will deteriorate.

Is the trans-brachial approach possible?

The trans-brachial approach involves the use of modified Simmons as a parent catheter. It is difficult to raise it to the external carotid artery in all cases, and in many cases, the procedure will be performed proximal to the common carotid artery.

Systemic heparinization is mandatory, but the risk of thromboembolism remains, and microcatheter backup problems are expected. However, several institutions have reported successful head and neck IA infusion via the trans-brachial approach, so it is important to know that it is technically possible when it becomes necessary.

We are not getting requests for head and neck IA infusion. What can we do?

If you, from the radiology IVR department, want to promote IA infusion to otolaryngology and head and neck surgery departments, try to propose it for inoperable or locally advanced cases even when it is palliative, rather than aiming for radical cure. Even if the result turns out to be disappointing, surgeons may be surprised how effective the treatment is and wish they had done it sooner. In addition, depending on the site, there may be cosmetic advantages to not having surgery, which is often appreciated by the patient and his/her family, and this often encourages the physician in charge of the patient.

How long should the procedure take?

Preoperative 3D-CTA should be performed to confirm the direction of origin of the feeding artery. When selecting a branch, you may be blindly rotating the microguidewire, while monitoring the fluoroscopy screen. Use a roadmap. The tips of microcatheters and micro guidewires must be bent. For difficult vessels, arterial redistribution technique should be considered. You may be using only lateral fluoroscopy images. Using a frontal image will make it faster. Use the memory function and auto-map function to adjust the C-arm angle and to restore its position, instead of adjusting the C-arm by hand. If the technician is unfamiliar with the procedure, provide him or her with a manual to rehearse the procedure at least one day in advance.

The final target time is 1.5 hours for the first 6-vessel DSA+CT+IA infusion, and 40 minutes for the second 3-vessel DSA+IA infusion. This should be achievable.

Which is better, to perform external beam irradiation before or after IA infusion?

We often hear that clinicians want to finish external beam irradiation first if possible, since there is time for bed rest after the release of pressure. Theoretically, it seems better to perform IA infusion first, since the interaction occurs when irradiation is performed while platinum is accumulated in the cancer cells. However, in vitro, CDDP-treated cancer cells show strong G2/M accumulation up to 72 hours after irradiation, indicating that even if irradiation is performed first, an interaction effect can be achieved for 3 days from the next day of IA infusion. For facilities that do not offer irradiation on Saturdays and Sundays, performing IA infusion on Thursdays and Fridays may not be desirable.

Can carboplatin and nedaplatin be used?

Since all platinum-based drugs are detoxified by sodium thiosulfate, they can theoretically be used in RADPLAT. However, their detoxification efficiencies vary by orders of magnitude, with cisplatin's detoxification efficiency outperforming that of other platinum-based drugs. Cisplatin also has the advantage of preventing renal damage almost entirely due to sodium thiosulfate, as well as less myelosuppression than carboplatin or nedaplatin. In practice, it will be difficult to increase the therapeutic intensity by combining detoxification for platinum-based drugs other than cisplatin.

Can nanoplatin be used?

Nanoplatin (micellar formulation of cisplatin) is rather unsuitable due to its enhanced sustained-release dosage. The concept of head and neck IA infusion is to use the concentration-dependent nature of cisplatin to penetrate tumor resistance and achieve radical cure.

Should the arterial redistribution technique be used for the neuromeningeal trunk?

The oropharyngeal branch of the ascending pharyngeal artery is involved in the posterolateral extension of cancer of the root of the tongue, and the nasopharyngeal branch plays a major role in IA infusion to the lateral retropharyngeal lymph node, known as the Rouvière lymph node. Meanwhile, the neuromeningeal trunk (NMT) of this artery is known to be a risky vessel due to its feeding branches to the inferior cranial nerves.

Perhaps a very slow flow of cisplatin from just past the origin of the NMT might prevent the risk at that moment. However, as treatment progresses, the effective vascular bed of the tumor decreases and dangerous reflux increases. A situation in which a microcatheter can no longer be inserted into the narrowed NMT branch may well be anticipated, when the NMT needs to be embolized. Even if it takes extra steps, the NMT should be embolized; a single Hilal embolization coil should suffice.

Is head and neck IA infusion covered by health insurance?

Currently, the techniques of head and neck IA infusion are not covered by insurance in Japan. Therefore, a fee is charged for arteriography. In addition, it is likely that the arterial redistribution

technique will be performed for the first time, in which case it can be claimed as arterial embolization. Furthermore, in the Diagnosis Procedure Combination (DPC), an item for IA infusion chemotherapy was newly established in the 2004 revision for head and neck malignancies, and as of the 2020 revision, it is 40,000 to 50,000 points higher than the regular chemoradiation therapy. In the past, cisplatin (cisplatin for intravenous infusion) was also used off-label, but the Ministry of Health, Labor and Welfare approved the indication for IA infusion in a 2011 notice. Today, there is no deficit with using guiding catheters.

The catheter is not moving as it should. What can I do?

A catheter does not take a straight route from where a sheath is placed to the tip, it advances while bending, hitting the vessel walls at several areas including the aorta and the carotid artery.

When the catheter is manipulated (inserted, removed or rotated) by hand, the force is transmitted along the catheter in a progressive manner and is resisted at the point where it hits the vessel wall. When the force builds up and exceeds the resistance, transmission is resumed to the more distal part of the catheter, and the force starts to build up again at the point where the catheter contacts the vessel wall. The catheter tip starts to move only after such repetition with a time delay.

Compared to catheters used in the trunk region, catheters in the head and neck region have an effective length of 30 cm to 50 cm longer, which increases the number of points at which the catheter encounters resistance against the vessel wall. Microcatheters are also smaller in diameter than the ones used in the abdomen, so the material tends to be softer and more prone to warping and twisting (making it more difficult to transmit force directly).

For these reasons, catheter manipulation in the head and neck region tends to cause a time lag between movements at the hand and at the tip, which tends to trouble inexperienced surgeons. Even if you let go of your hand when the tip reaches the desired position and angle, it will often continue to move on its own. Be aware that there is a force built up in the catheter itself, so try to release it with a reverse operation (i.e. opposite lock, counter-steer, counteracting).

Is salvage surgery possible when the tumor remains?

Since salvage surgery after radiotherapy is associated with problems such as scarring and fibrosis of the irradiated tissues, there are concerns about whether the surgery can be performed safely, whether appropriate surgical margins can be determined, and whether local control can be achieved.

However, as far as maxillary sinus cancer is concerned, the salvage rate of maxillectomy or

total maxillectomy after IA infusion is reported to be about 61%, and long-term survival can be expected if local control is achieved.

On the other hand, the salvage rate for pharyngeal and laryngeal cancer is not always satisfactory, the risk of severe infection and fistula formation, and the higher incidence of distant metastasis after surgery compared to maxillary sinus cancer (This is true not only for IA infusion but for chemoradiotherapy in general).