

Case report

## Use of the direct puncture technique in management of capillaro-venous malformations: case report

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### Abstract

**Background:** Preoperative devascularization of the capillaro-venous malformations located in the aero-digestive tract is important for surgeons, to minimize blood loss during surgical excision of malformations.

**Case presentation:** Here we present two cases of capillaro-venous malformation in which we could successfully achieve preoperative devascularization, by directly injecting n-butyl cyanoacrylate into the capillaro-venous bed. This technique is relatively easy, safe and cheap, and can be carried out immediately before surgery.

### Background

The most common localized tumor of the head and neck is the hemangioma, and more than 50% of all congenital hemangiomas are located on the head and neck [1]. The hemangioma may present in various forms, for example capillary, cavernous, or mixed, the most common being a capillary hemangioma. Most authors dispute whether this classification can be based on clinical appearance only. In fact, most of these tumors may actually have mixed capillary and cavernous hemangiomas, and are better known as Capillaro-Venous malformations.

These capillaro-venous malformations may affect not only the cutaneous surfaces of head and neck but also the mucosal surfaces.

Because these capillaro-venous malformations in the upper aero-digestive tract may cause difficulty in swallowing and/or breathing, and may even threaten the life if the pa-

tient aspirates while bleeding, they are best treated surgically [2-4].

As these malformations have a marked propensity for bleeding during excision, the value of preoperative embolization is well established. The objective of embolization is to devascularise these malformations by catheterization and embolization of each vessel supplying the tumor, which is not always achieved because most of them are fed, by many small vessels that may be too small for the catheter to pass. We present two cases where we have used a devascularization technique for these malformations by direct injection of *n-butyl cyanoacrylate* (NBCA) into the capillaro-venous bed.

### Case Presentation

#### Case 1

A 24 years male had presented with slowly increasing bluish swelling over palate since birth that had occasionally bled. He had a capillaro-venous malformation over oral

surface of the soft palate; the nasopharyngeal surface of the soft palate was not involved. The capillaro-venous malformation was punctured with a 22-gauge needle and progression of the needle was monitored by 2-D fluoroscopy. After verifying the correct location of the needle by reflux of blood at the hub, the contrast agent was injected into the capillaro-venous malformation, revealing the local parenchymography draining to the regional veins without extravasation. NBCA and lipiodal then were mixed in equal proportions and injected slowly under fluoroscopy control with a 2 ml syringe to completely occupy the entire capillary bed (fig 1). Subsequently the capillaro-venous malformation was totally resected in the same sitting. A good plane of cleavage was obtained because of retraction of the malformation induced by devascularization. Peroperative blood loss was negligible (<10 ml). The resected specimen was subjected to histopathological examination which confirmed the nature of capillaro-venous malformation and demonstrated that the embolization agent occupied almost whole of the capillaro-venous bed.

### Case 2

A 55 years old male presented with repeated episodes of bleeding from mouth especially after taking meals. On detailed examination left tonsillar hemangioma (capillaro-venous malformation) was diagnosed to be the cause of this bleed. This hemangioma was also devascularised with direct puncture technique under general anesthesia (fig 2) as described above and subsequently left tonsillectomy along with excision of the hemangioma was done. Histological confirmation of the capillaro-venous malformation was done. Peroperative blood loss was negligible (<10 ml) and a good plane of cleavage was obtained.

### Discussion

Preoperatively devascularization of the capillaro-venous malformation to decrease peroperative blood loss is desired by the surgeons. The conventional intravascular embolization technique has following limitations- (1) the devascularization is rarely complete as it is often not possible to embolize each and every feeding vessel, as some of the feeding vessels may be too small to negotiate the catheter, (2) a very experienced interventional radiologist team is required to carry out embolization, (3) time consuming, (4) expensive, (5) difficult to carry out surgical excision of the malformation in the same sitting.

Whereas, the direct puncture technique has following advantages- (1) total devascularization is easily achieved, (2) does not require a team of intervention radiologists and can be carried out by the surgeon, (3) can be done immediately before surgery in the same sitting, (4) less time consuming, (5) relatively inexpensive.

Although direct puncture technique is safe but sometimes anaphylactic shock [5] can occur. The embolizing agent getting transported into draining vessels causing complications e.g. pulmonary embolization [1] is reported. This technique can be safely carried out under fluoroscopic control by first doing local parenchymography and then keeping a close vigil on the slow progression of the embolization agent, suspending the injection when embolization agent penetrates into the draining vessels. This technique should be carried out under general anesthesia as direct injection of the embolization material into the capillaro-venous malformation in a conscious patient is extremely painful and also immediate surgery cannot be done.

We chose NBCA as the embolising agent because it solidifies immediately on coming in contact with moisture, has antimicrobial properties [6] and has minimal tissue toxicity. NBCA is mixed with Lipiodal to make it radio-opaque. Other embolising agents may be used, for example ethibloc, ethanolamine oleate, sodium tetradecyl sulfate, polidocanol but they have various demerits in their use like Ethanolamine oleate has high viscosity that makes injection difficult, it also has a tendency of renal failure at high doses, and allergic reactions are also known. The main disadvantage of Ethibloc as an embolising agent is its long solidification time (3–5 minutes) making it susceptible to flow out into systemic circulation [7]. Sodium tetradecyl sulfate has a significant incidence of epidermal necrosis, causes hyper-pigmentation, and occasional anaphylaxis is known. Telangiectatic matting is seen following injection of Polidocanol, it also causes hyper pigmentation and anaphylaxis.

### Conclusion

We believe that this technique is relatively simple, less time consuming, cheap and permits surgical excision of the capillaro-venous malformation with lesser extent of bleeding.

### Competing interests

None declared.

### References

1. Tonner PH, Scholz J: **Possible lung embolism following embolization of a hemangioma with fibrin glue.** *Anaesthesist* 1994, **43(9)**:614-7
2. Jackson IT, Carreo R, Potparic Z, Hussain K: **Hemangiomas, Vascular Malformations, & Lymphovenous Malformations: Classification & Methods of Treatment.** *Plast Reconstr Surg* 1993, **91**:216-30
3. Kane WJ, Morris S, Jackson IT, Woods JE: **Significant Hemangiomas & Vascular Malformations of Head & Neck: Clinical Management and Treatment Outcomes.** *Ann Plast Surg* 1995, **35**:133-43
4. Chen MT, Horng SY, Yeong EK, Pan QD: **Treatment of High Flow Vascular Malformations in the Head & Neck with arterial ligation followed by sclerotherapy.** *Ann Plast Surg* 1996, **36**:147-53
5. Orsel I, Guillame A, Feiss P: **Anaphylactic shock caused by fibrin glue.** *Ann Fr Anesth Reanim* 1997, **16(3)**:292-3

6. Eiferman RA, Synder JW: **Antimicrobial effect of Cyanoacrylate glue.** *Arch Ophthalmology* 1983, 101
7. Martn-Granizo R, RodrguezCampo F, Muoz E, Canoego JL, Garca Gonzlez MD, Daz Gonzlez F: **Giant Lip Angioma embolized with Ethibloc: A Clinical and Histopathological Study.** *Medicine Oral* 1998, 3:230-6

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