Ethanol injection therapy for oral haemangiomas

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Objective: The objective was to simply and effectively treat oral haemangiomas without complications using ethanol injection.

Methods: As much blood as possible was aspirated from a haemangioma, and then absolute ethanol was injected into the cavity. For especially large haemangiomas, we repeated the treatment.

Results: Good results were obtained without complications, no enlargement or recurrence of the haemangiomas, no pain, swelling, or deformation.

Conclusion: Aspiration of blood and ethanol injection therapy for symptomatic oral haemangiomas is safe, effective, easy to perform, and results in minimal deformation and scarring.

Key words: ethanol injection, oral haemangioma, aspiration

Introduction

Although the head and neck is a common site of haemangioma, the rate of occurrence of lesions in the tongue and lip is especially high. Although various therapies for oral haemangiomas that considered local function and aesthetics have been evaluated, there has yet to be a consensus on an optimal treatment that provides reliable, aesthetic outcomes. Therefore, we report our experiences with ethanol injection therapy for oral haemangiomas.

Methods

According to the methods described by Yane et al., after we aspirated the blood from the haemangioma with a 1 ml syringe with a 23 gauge (G) needle, we injected 0.1 – 0.2 ml 99% ethanol into the cavity with another syringe with a 23 G needle. For especially large haemangiomas, we repeated the treatment.

Cases

Case 1
A 57-year-old woman had a violet tumour on her lower lip. Although she had first noticed the haemangioma more than 10 years earlier, she had not requested treatment because it was asymptomatic. Because a swelling sensation of the lower lip had developed and started to progress, she visited a clinic and was referred to our hospital. During the first medical examination, she presented with two swollen violet haemangiomas in the lower lip and labial gingiva (Figure 1A).

After aspirating 0.05 ml of blood (Figure 1B) from the haemangioma in the lower lip and 0.15 ml of blood from the haemangioma in the lower labial gingiva, we injected 0.1 and 0.2 ml 99% ethanol into the two cavities, respectively. Although she complained of mild pain during the injections, the pain disappeared immediately after. And while the swelling sensation of the lower lip continued for a few days, it also soon subsided. Fifty-four days after her first visit, she presented with smaller but remaining haemangiomas in both locations (Figure 1C); therefore, we repeated the treatment. During an examination 110 days after her first visit, and second injection therapy, although both haemangiomas appeared slightly violet, they seemed to have improved (Figure 1D). There has been no enlargement of the haemangiomas, pain, swelling or deformation of the lower lip since the second injection, and the prognosis was good.

Case 2
A 67-year-old man complained of a violet tumour of the tongue. He had first noticed the tumour approximately 10 years earlier and had visited a dental clinic. There, he was diagnosed with granulation, due to his teeth, and had been followed up with only observation. Although there
was no subsequent enlargement or symptoms, the colour of the lesion continued to darken. Therefore, he was referred to our hospital. During the first medical examination, we discovered three swollen, violet haemangiomas in the right side of the tongue (Figure 2A).

After we aspirated 0.03 ml, 0.02 ml, and 0.1 ml of blood from the haemangiomas, we injected 0.1 ml of 99% ethanol into each of them. The patient did not complain of pain during or after the injection and there was no swelling of the tongue. At 21 days after the first visit, although the colour had lightened, we found remaining haemangiomas; therefore, we repeated the treatment of aspiration and ethanol injection. At 100 days from the first visit, all the haemangiomas had disappeared completely (Figure 2B). There has been no recurrence, pain or swelling, and the prognosis was good.

Case 3
A 13-year-old boy presented with a tumour of the tongue. He had first noticed the tumour and visited a clinic 6 months earlier. While there were no symptoms, there was no change after 6 months, so he was referred to our hospital. During the first medical examination, we
discovered a violet haemangioma on the right side of the tongue (Figure 3A).

After we aspirated 0.1 ml of blood from the haemangioma, we injected 0.1 ml of 99% ethanol into the cavity. Although he complained of mild pain during the injection, the pain disappeared immediately after. There was no swelling of the tongue. Seven days after the first visit, the haemangioma remained slightly violet, but the colour continued to lighten over time and completely disappeared within a few days (Figure 3 B).

Discussion

Radiotherapy, surgical excision, cryotherapy, and thrombotherapy have all been used to treat haemangiomas. However, there is currently no definitive therapy, so that the treatment needs to be selected on a case-by-case basis.

Some haemangiomas are radiosensitive, and there have been reports of using radiation to reduce the size of the haemangiomas before surgical excision. However, the indications for using radiation are controversial, because haemangiomas are benign. Surgical excision is a common treatment. Although it is easy to excise small and local haemangiomas, it is impossible to avoid leaving a defect and a scar in cases with large haemangiomas. Cryotherapy is useful, because the bleeding and pain are generally minimal, and the procedure is easy to perform. However, it takes a relatively long time for the lesions to heal, because the epithelium is regenerated and covered through the necrosis and decidualion of tissue after cryotherapy. Thrombotherapy is useful for large haemangiomas, but difficult to perform for small haemangiomas, and is not used by most otolaryngologists.

Ethanol is applied in pain clinics as a nerve blocker, and it is used in the field of internal medicine. There have been previous reports suggesting that ethanol can be applied for esophageal varices with a catheter, for embolus therapy for renal cell carcinoma, and for both hepatic cysts and renal cysts. With regard to haemangioma of the head and neck, Berenstein reported that he treated a haemangioma of the upper lip and obtained a good result. Four years later, Tress et al. reported that they used ethanol injection to treat cavernous haemangiomas.

There have been some animal experiments that have shown tissue changes after intravascular ethanol injection. Ellman et al. reported thrombus formation after injecting absolute ethanol into the renal artery of dogs. Buchta et al. found a precipitate of a substance similar to protein at the Bowman’s capsule, necrosis similar to fibrin in the glomerulus, intravascular congestion, and other signs of renal toxicity 2 minutes after ethanol injection during a similar study. However, they reported that it took a longer period of time to form a thrombus like that found in the Ellman et al. study. Ekelund et al. found thrombus formation in the renal artery and renal infarction after 95% ethanol injection into the renal artery of rabbits and pigs. Doppman et al. and O’Riordan et al. reported similar findings in monkeys and dogs, respectively.

The mechanism of ethanol injection therapy is: 1. the dehydration and coagulation induced by ethanol causes agglutination and coagulation of blood cell components and the formation of small clots or thrombi, 2. direct destruction of tumour blood vessels by ethanol begins simultaneously, 3. injury of angioendothelial cells causes platelet thrombus formation, followed by thrombus formation, 4. hypovolemia is caused by spasms of the blood vessels due to the formed thrombus, 5. edema of the surrounding tissue caused by destruction of blood
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vessels, and the subsequent circulatory dysfunction leads to necrosis of the lesion. These phenomena cut off the circulation to the lesion.

The head and neck is a common site of haemangiomas, which occur especially frequently in the tongue and lip. Such lesions are associated with issues related to function and aesthetics, because they are conspicuous, bleed easily, are exposed to biting during mastication, and may influence the individual's phonation. There are many cases that recur from residual haemangiomas, because complete excision is difficult, and some cases range over the pharynx, making complete removal impossible. The lip is also a relatively difficult area to treat by an extended excision and reconstruction.

In this respect, ethanol injection therapy, which causes no tissue defect, is an excellent treatment option. It is particularly well suited for the treatment of submucosal lesions of the lip because it causes less necrosis than that for dermal and subcutaneous lesions. Even if the treatment initially causes some slight necrosis, good healing can be expected in due course of time because of the highly regenerative constitution of mucomembranous tissue. This treatment can, therefore, be repeated several times and still obtain good cosmetic results. In addition, this treatment is advantageous because the resulting tissue defect is minimal compared with that when the lesion is excised, which then likely requires follow-up plastic surgery for aesthetic reconstruction. However, some problems remain that need to be addressed, e.g., pain during the ethanol injection, transient swelling after the injection, and the necessity for repeated injections for large lesions. Overall, however, these results indicate that aspiration of blood and injection of ethanol is a safe and effective therapy for symptomatic oral haemangiomas.

References