

Case Report Orthopaedics

TREATMENT OF ANEURYSMAL BONE CYST WITH PERCUTANEOUS SCLEROTHERAPY USING SINGLE DOSE OF POLIDOCANOL : A CASE REPORT

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Article submitted on: 28 March 2019

Article Accepted on: 13 April 2019

Abstract

Introduction: Aneurysmal bone cyst is a rare benign tumour-like lesion which develops during growth. Percutaneous sclerotherapy is one of the safe alternative to surgery for treatment of aneurysmal bone cysts (ABCs) suggested by recent studies. We present our experience of this method involving single dose of the agent.

Method And Materials: Our aim was to determine the efficacy of the administration of percutaneous intralesional 3% polidocanol (hydroxypolyaethoxydodecan) as sclerotherapy in a 7 year old female child with histologically proved aneurysmal bone cyst of proximal tibia, the sclerotherapy was a single dose injection, performed under fluoroscopic guidance under sedation and local anaesthesia, 420 mg of 3% polidocanol (Approximately 1 ml of 3% polidocanol was injected per 1 cm³ volume of the lesion). The follow-up period was 12 months. Radiological and clinical assessments were performed until healing.

Results: The cyst healed after one injection at the time period of 9 months with adequate range of motion and normal functional outcome.

Keywords: Aneurysmal bone cyst, percutaneous sclerotherapy, polidocanol

Interpretation

Our results show that percutaneous sclerotherapy with polidocanol has high efficacy in the treatment of ABCs, with a low frequency of side effects. Our findings corroborate data presented in previous publications. We believe that the method will be especially valuable in Aneurysmal Bone Cysts of the tibia, where surgery is associated with considerable morbidity.

Aneurysmal bone cysts (ABCs) are rare expansile osteolytic tumors with an annual incidence of 0.14 per 105; they are usually diagnosed at adolescence, and are equally rare in both sexes⁽¹⁾. An eccentrically located, lytic, expansile lesion in the metaphysis with cortical thinning and a subperiosteal thin shell of bone is considered to be typical of an aneurysmal bone cyst. Management includes combinations of embolization, curettage with or without bone grafting, cementing of the cavity, reconstructive surgery, and most recently sclerotherapy⁽⁷⁾. Surgical and adjuvant treatment have a high rate of complications.⁽²⁻⁶⁾ Sclerosants act by causing damage to the endothelium of vessels and starting a coagulation cascade that results in thrombosis. The use of polidocanol as an endovenous sclerosing agent to treat varicose veins dates from the 1960s, and has been recently shown to be effective in the treatment of ABCs⁽⁸⁾. In a case series of 72 patients treated with percutaneous intralesional injections of polidocanol⁽⁹⁾, a cure rate of 97% was reported. Similarly, in a prospective study, sclerotherapy was as effective as intralesional excision, but with less morbidity⁽¹⁰⁾. Overall, sclerotherapy has emerged as a promising treatment that could eventually replace previous methods, which may be associated with considerable morbidity.

However, it is not widely accepted and its efficacy remains to be verified in large series of patients. Here we report our experience of percutaneous sclerotherapy of ABC.

Patient and method

Patient is a 7 year old female child presented to us at MGM Medical college and M.Y. Hospital, Indore, India with complaints of pain and swelling in her left leg since 2 months, x-ray was suggestive of an osteolytic lesion at the proximal tibia, histopathological examination was suggestive of Aneurysmal bone cyst. Provisional diagnosis was based on the radiological characteristics of the lesion (figure 1) and confirmed with the histological biopsy. The sclerotherapy was a single dose injection, performed under fluoroscopic guidance under sedation and local anaesthesia, by a 16 gauge needle, performed under fluoroscopic guidance under sedation and local anaesthesia by 420 mg of 3% polidocanol (Approximately 1.2 ml of 3% polidocanol was injected per 1 cm³ volume of the lesion)⁹ by the brand name Asklerol 3% 2ml by Samarth life sciences pvt. Ltd. (1ml contains 30 mg Polidocanol). Back flow of the sclerosant was prevented by locking the needle for one minute and subsequently flushing it with 0.5 ml of normal saline. Patient was advised to avoid contact sports and strenuous activity until the lesion healed. Patient was allowed normal weight bearing and was followed until the lesion showed evidence of sclerosis and the symptoms subsided (defined as healing).



Figure 1 - Lesion

Results

There was no anaphylaxis, major adverse reactions or minor inflammatory reaction, infection, or local necrosis at the injection site. We did not observe any limb length discrepancy or arrested growth. The patient was allowed to bear weight after 1 week of therapy, following which she continued her routine activities, follow up at 4 weeks showed significant radiological x-ray condensation of the osteolytic tissue and shrinkage in size and less pain, further follow up at 3, 4, 7, 9 months (Figure 2,3,4,5,6) reveal progressive shrinkage in osteolytic tissue size and condensation and no clinical symptoms with free range of motion.

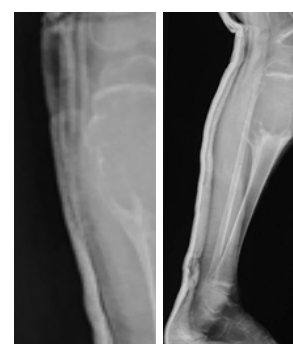


Figure 2 (3 months)



Figure 3(4 months)



Figure 4 (7 months)

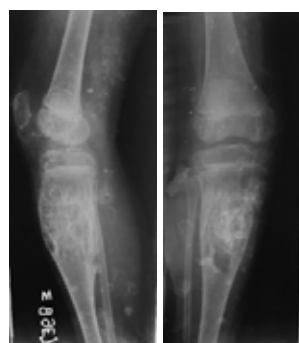


Figure 5 (9 months)



Figure 6 (12 months)



Figure 7 (12 months)

Discussion

It has been classically considered as an arteriovenous fistula, 1 but some consider it to be posttraumatic 3 in origin and others a *de-novo* lesion. 4 A venous impedance etiology⁵ has also been proposed. However, most consider it to be some type of vascular malformation, justifying the term 'benign vascular tumour of bone'^(2,6,11,12) It may be a primary⁽¹³⁾ lesion or superimposed upon another lesion^{14,15} The optimal treatment method for ABC is still being debated. Open curettage with or without bone grafting is a widely accepted mode of treatment, but it is accompanied by a high recurrence rate of approximately 30%, which can be reduced to 15% when a high-speed burr is used⁽¹⁰⁾. Wide en-bloc resection gives excellent results in terms of local control, which approximates 100%. Yet, wide surgical margins are often not feasible, as the lesion can be close to neurovascular structures. Furthermore, extensive surgery is associated with considerable morbidity. Cumulative data suggest a growth disturbance rate of about 10% after various surgical procedures^(16,17,18,19). Radiation therapy has also been used, with local control rates that are comparable to those for intralesional therapy^(20,21). However, a major concern is the risk of secondary malignancies, especially in the case of younger patients⁽²²⁾. Other potential complications are the

possibility of epiphyseal arrest and secondary deformity. The use of high-precision mega-voltage radiotherapy and percutaneous radionuclide ablation has given better results, but is yet to be evaluated in larger series of patients^(23,24). Embolization of the feeding arteries has also been suggested as an alternative, with good results reported⁽²⁵⁾. However, the procedure is technically demanding and is not applicable to all cases, as ABCs often lack large afferent vessels. When used for the treatment of ABC of the spine, selective angiography is necessary to ensure that there is no risk of spinal cord ischemia. Thus, it is usually regarded as a supplement to surgery⁽³⁾. Polidocanol sclerotherapy compares favorably with the above treatments. In our hands and also in previous reports^(9,10), it has an efficacy exceeding 90%. Furthermore, the treatment is simple and carries negligible risk of morbidity, there is no scar formation, and it can be reliably performed as a day-case surgery. The method is applicable to all cases, and does not require sophisticated technical equipment. Most importantly, sclerotherapy can be effective in the case of lesions of the pelvis and sacrum that are difficult to treat surgically due to the risk of heavy bleeding and other major complications⁽²⁶⁾ The need for multiple injections and prolonged treatment is an obvious disadvantage which doesn't seem to be the problem with our case which required one injection only. However, prolonged follow-up is also the case for patients treated with surgery, radiotherapy, and embolization as healing of ABC is generally delayed⁽¹⁰⁾ There is also reported growth disturbances in 4% of their patients treated with polidocanol⁽¹⁰⁾ We did not observe any such event in our case. The use of polidocanol

is a definite an advancement over previous sclerotherapy regimens that relied on alcoholic zein solutions, which were more toxic and had serious adverse effects after spill-out into nearby tissues^(27,28,29). There has been documented fatal outcome after injection in an ABC^(30,31). Indeed, we observed no inflammatory reactions, which is in line with previous studies^(9,10). Percutaneous administration of polidocanol should be the standard treatment for ABC, sequential if required, as we have found it to be a safe, simple procedure with an excellent outcome. Further cases of Aneurysmal bone cyst are being treated and followed up at our institute. All data that have accumulated thus far strongly favor sclerotherapy with polidocanol over surgery and suggest that it could become the treatment of choice for ABC.

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