International Journal of Research in Orthopaedics
Paik S et al. Int J Res Orthop. 2026 Mar;12(2):520-525
http://www.ijoro.org

Case Report

DOI: https://dx.doi.org/10.18203/issn.2455-4510.IntJResOrthop20260527

Primary calcaneal aneurysmal bone cyst in a 5-year-old treated with serial polidocanol sclerotherapy: a case report

Soumya Paik[1]*, Tathagata Bose[1], Sourav Bhowmik[2]

[1]Department of Paediatric Orthopedics, KIDS Orthopedic Clinic, Kolkata, West Bengal, India
[2]Department of Histopathology and Cytopathology. Suraksha Diagnostic Limited, Kolkata, India

Received: 20 December 2025
Accepted: 03 February 2026

***Correspondence:**
Dr. Soumya Paik,
E-mail: drsoumyapaik@gmail.com

ABSTRACT

Aneurysmal bone cyst (ABC) is rarely seen in the calcaneus of young children. To our knowledge, till date very less number of calcaneal ABC have been reported in the literature. A 5-year-old female child suffered chronic heel pain for last 2 months and was presented with x-ray showing a solitary and expansile osteolytic lesion within the calcaneus. Detailed clinico-radiological and histopathological examination suggested the lesion as ABC. The volume of the lesion was 11.9 cm3 as measured in the MRI. Curettage was not opted as wall of entire calcaneus was very thin and lesion was big compared to the age of child. Treatment was done with 4 sequential sclerosant polidocanol injection therapy over 9months, with minimum of 6 weeks interval in each injection. Dosage of the sclerosant therapy was calculated by weight of the patient (2-4 mg/kg) instead of volume of the cyst. No recurrence was observed over next 1 year by sequential X-rays. Age of the patient, anatomical location and severity in our case makes it unique. ABC can also be found in unusual locations like calcaneus even at 5 years age and can be managed by standard polidocanol protocol. In very young children with thin-walled, calcaneal ABCs, serial sclerosant injection may avoid morbid curettage/grafting.

Keywords: Aneurysmal bone cyst, Paediatric, Calcaneum, Sclerotherapy, Polidocanol

INTRODUCTION

Pediatric primary ABC in calcaneus is an extremely rare occurrence. To our knowledge, till date less than 50 cases of calcaneal ABC have been reported in the literature.[1,7-12] The age of the youngest reported calcaneal ABC was 8 years who was observed without treatment.[2] Most of the literature reported curettage with bone grafting to treat calcaneal ABCs. ABC accounts for approximately 1% of all primary bone tumors, of which only 3% of cases have been reported in the foot, of which only 1.6% involve the calcaneus.[1]

Calcaneal ABC's are more often symptomatic and less likely to be complicated by a pathological fracture.[3,4] There is paucity of literature, regarding sclerosant injection of pediatric calcaneus ABC, though it is a less morbid procedure than other treatment options like curettage with or without bone grafting, cementing of the cavity, reconstructive surgery etc.[5] Because of their rarity and atypical presentation, we report a 5-year-old with extensive calcaneal ABC managed with serial polidocanol sclerotherapy and outline dose rationale, technique, and one-year outcomes.

The guardians of the patient were informed that data concerning the case would be submitted for publication and they agreed and gave consent for it.

CASE REPORT

A 5 years old female child, with a body weight of 15 kg, came to our department with left heel pain for 2 months. It was of progressive aggravation, relieved by analgesic treatment, hampering her day-to-day activities. On clinical examination, she was having pain while walking, firm on

palpation and swelling of the heel region. Standard radiograph showed osteolytic lesion engaging the whole calcaneus without periosteal reaction (Figure 1). MRI showed a large lesion of the calcaneus, volume measured 11.9 cm^3, relatively well-circumscribed and inhabited by multiple partitions, with several fluid-fluid levels (Figure 2 A-C). Based on clinico-radiological data, differentials were made, of which ABC was first in the list. MRI showed liquid-liquid levels, but not specific to ABC and can also be present in telangiectatic osteosarcomas, chondroblastomas, and GCTs. That's why a HPE diagnosis is still necessary before surgery. The patient was then scheduled for surgery for a biopsy. During biopsy Jamshidi needle was introduced under C-arm guidance (Figure 3), and aspiration revealed blood (Figure 4). HPE showed presence of blood-filled cystic spaces separated by cellular septa containing fibroblasts, giant cells and woven bone formation (Figure 5). Based on the clinico-radiological and histopathology report it was diagnosed as primary ABC of the calcaneus. We planned for Sclerosant injection of the tumor. Dose of the sclerosant (Polidocanol) was first tried to determine with the help of the volume of tumor, but it would have been a large dose of sclerosant, so decided to go with another dosing system. Dose was determined by bodyweight of the patient (2-4 mg/kg).[5,6] We percutaneously put J. Needle in the bone, then attach a 3 way connector with the J needle, and attach polidocanol and normal saline with 2 ports. We mixed both the liquids for the next 1-2 minutes and then injected it into the bone (Figure 6) and kept the needle for 10 minutes. As the patient was 15 kg, so 15×4 mg=60 mg. One vial of polidocanol consists of 2 ml or 60 mg of polidocanol, so we gave 2 ml or 60 mg of polidocanol injection 4 times over a period of 9 months. In the postoperative period we gave below knee slab for 2 weeks, and strict non-weight bearing for the same duration. No adverse reactions noted during the sclerosant injection therapy like local skin necrosis, neurovascular events, infection, hypersensitivity etc.

There were signs of healing after each injection on X-rays which were taken approximately 6 weeks post injection. Calcaneus gradually became firm to hard after each injection and pain was also reducing sequentially. After the 4th injection the calcaneus became hard and the patient was completely painless. After the 4th injection, it was seen that it is now in stage 1 modified Neer classification of radiologic healing status which states cyst filled with new bone and small radiolucent area (<1 cm).

No sign of recurrence is seen over 1 year after the 4th injection, like no lytic and expansile area in bone, soap bubble appearance, bony destruction, involvement of soft tissue, periosteal reaction and there were no clinical signs for recurrence also like pain, swelling etc. (Figure 7-D). As there was no sign of recurrence, further imaging like CT or MRI was not done.

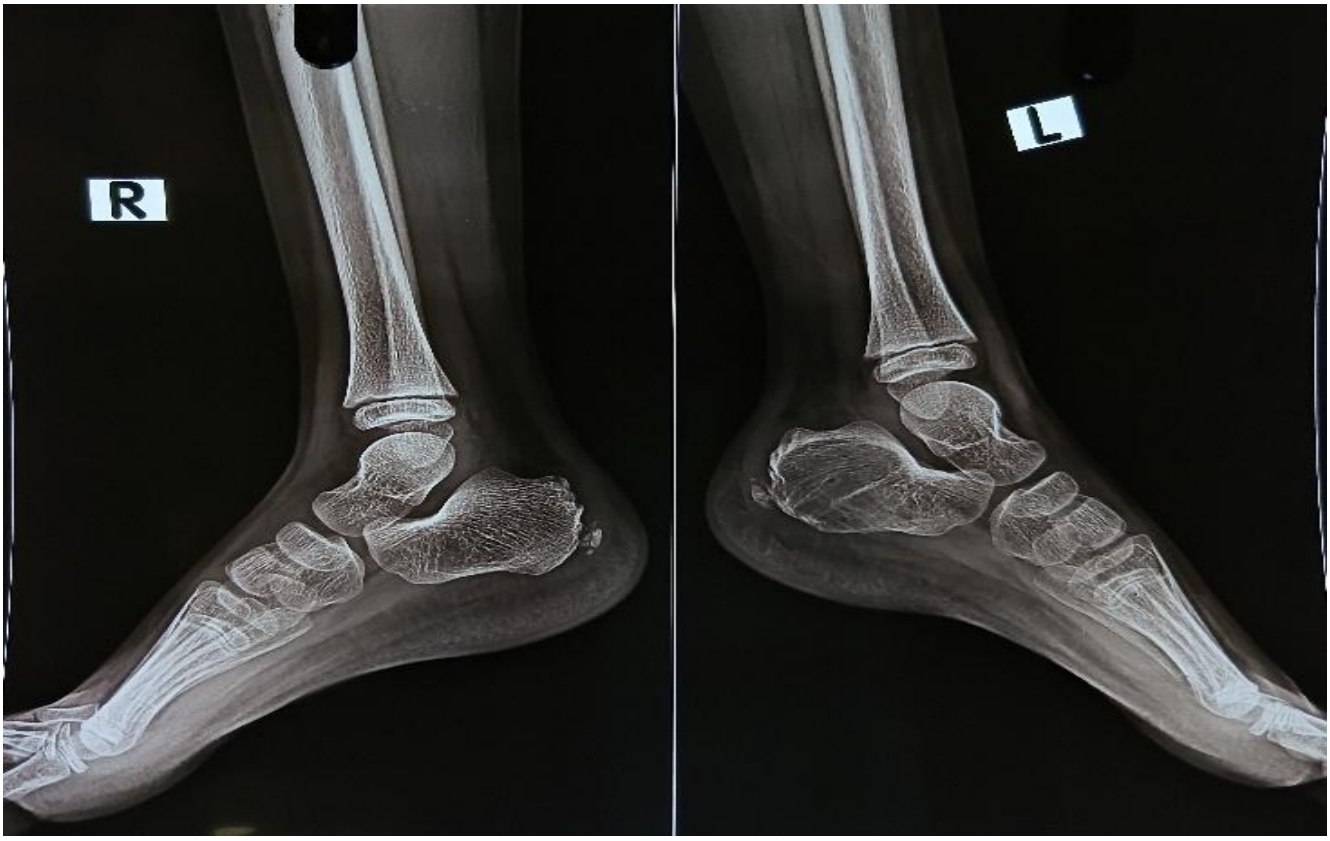

Figure 1: X-ray of left ankle showing osteolytic lesion of calcaneus.

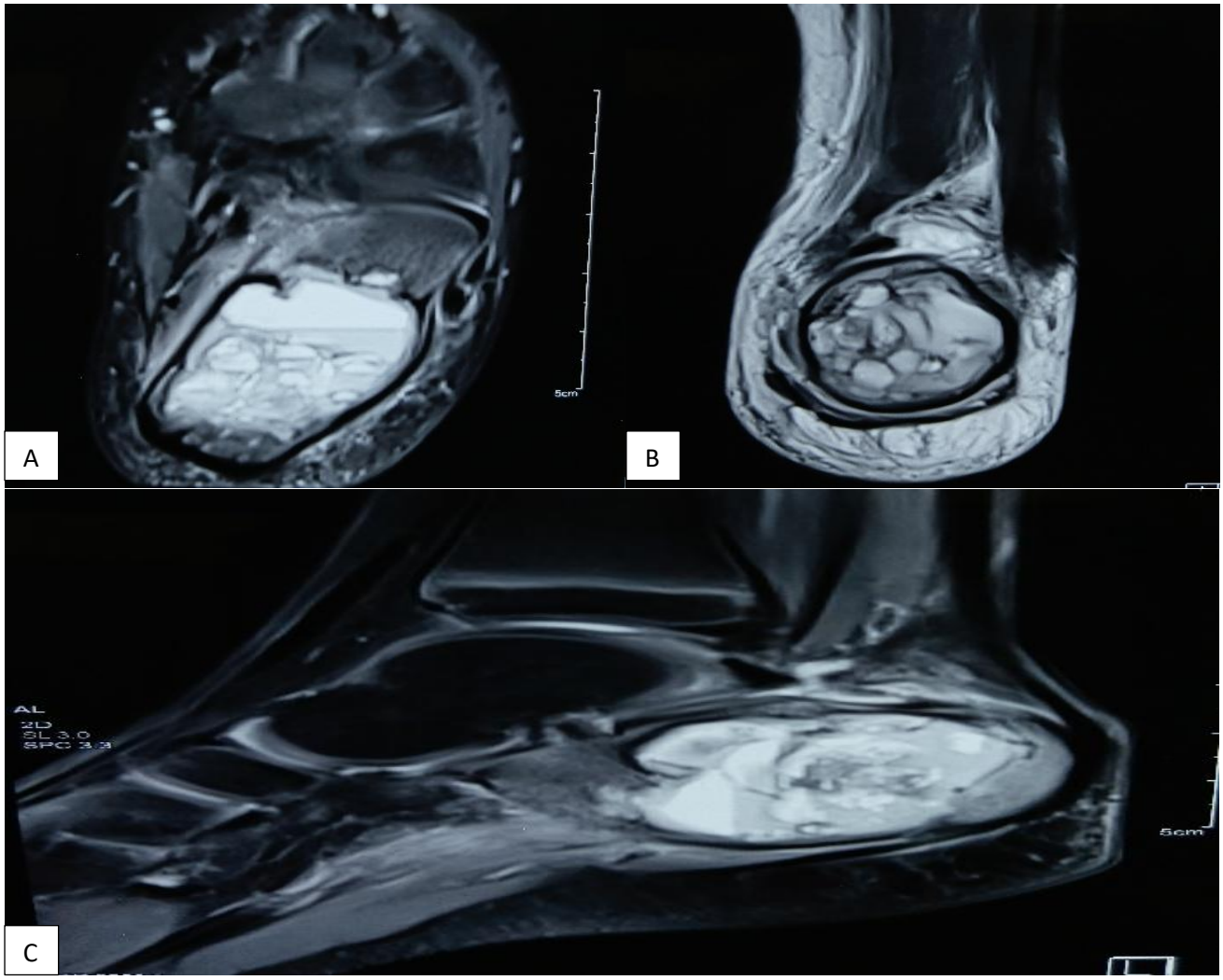

Figure 2 (A-C): A-MRI of left calcaneus coronal view showing multiple fluid-fluid levels. B-MRI of Left calcaneus axial view showing multiple fluid-fluid levels. C-MRI of Left calcaneus sagittal view of multiple fluid-fluid levels.

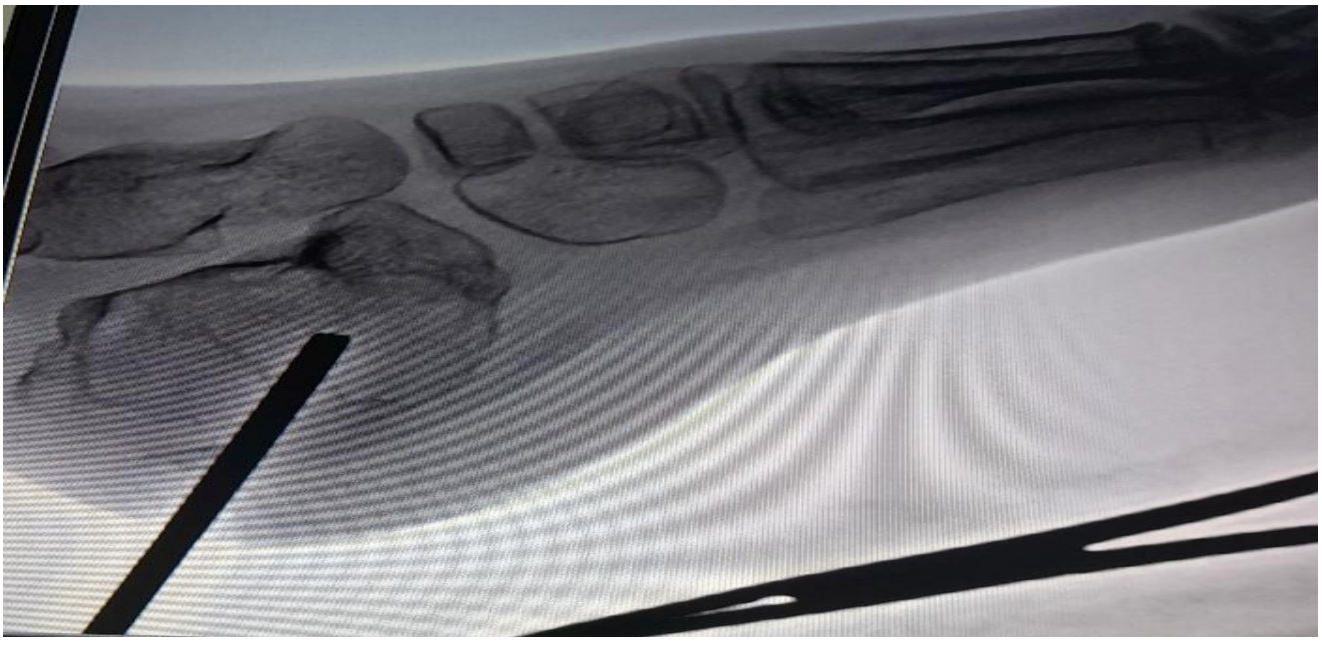

Figure 3: C-arm guided biopsy by J needle.

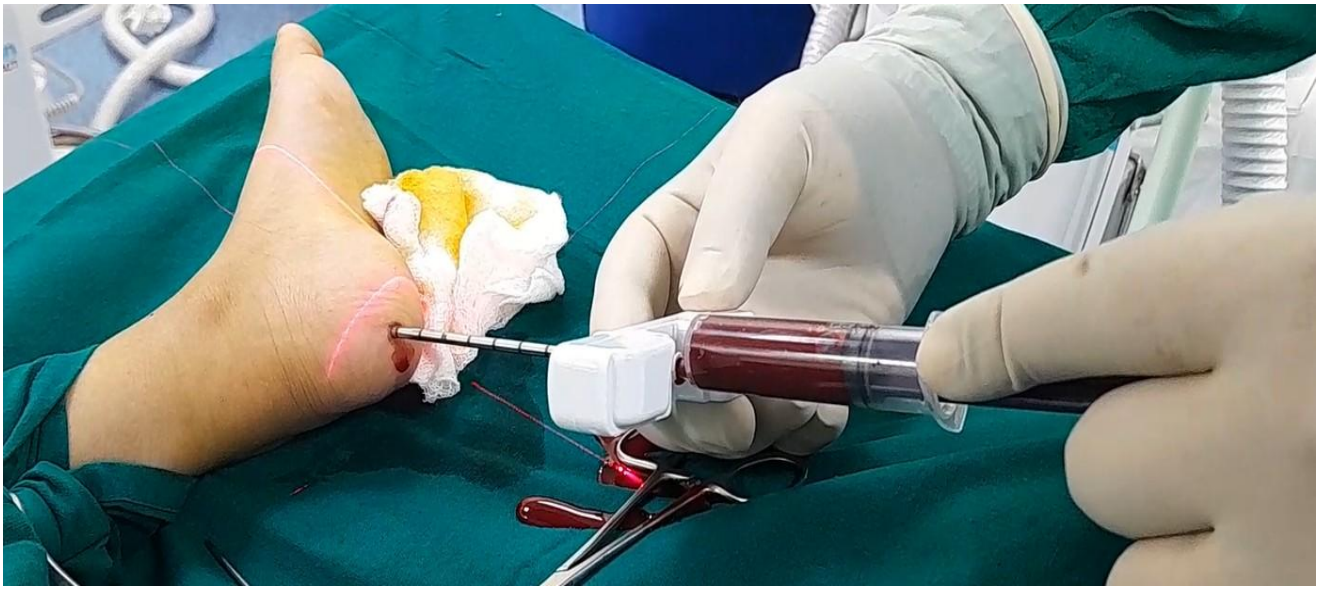

Figure 4: Aspiration showing blood.

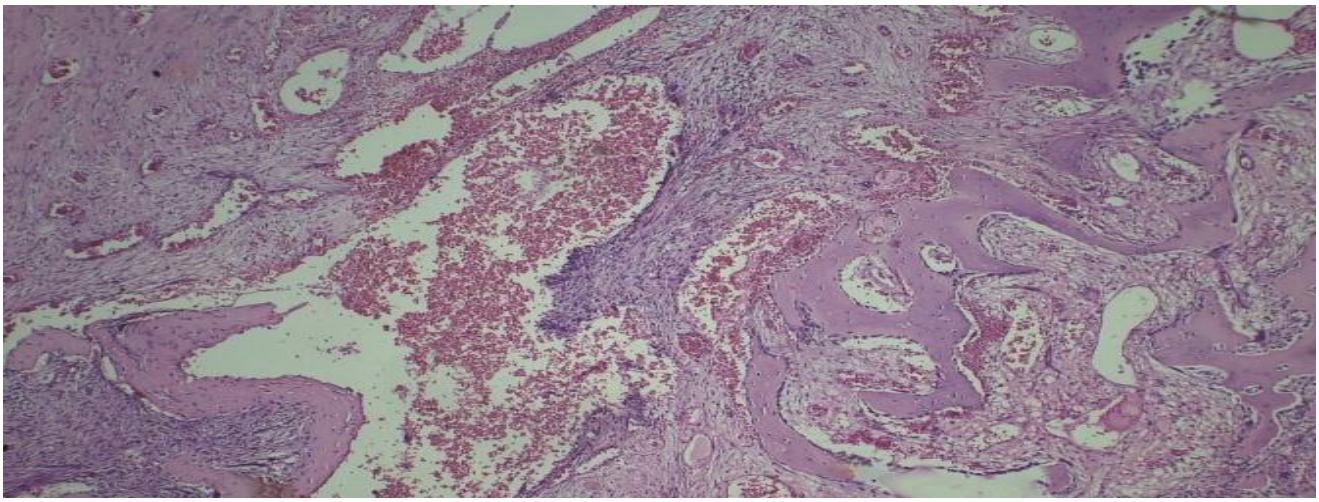

Figure 5: HPE 40×.

Figure 6: J needle connected with 3way connector.

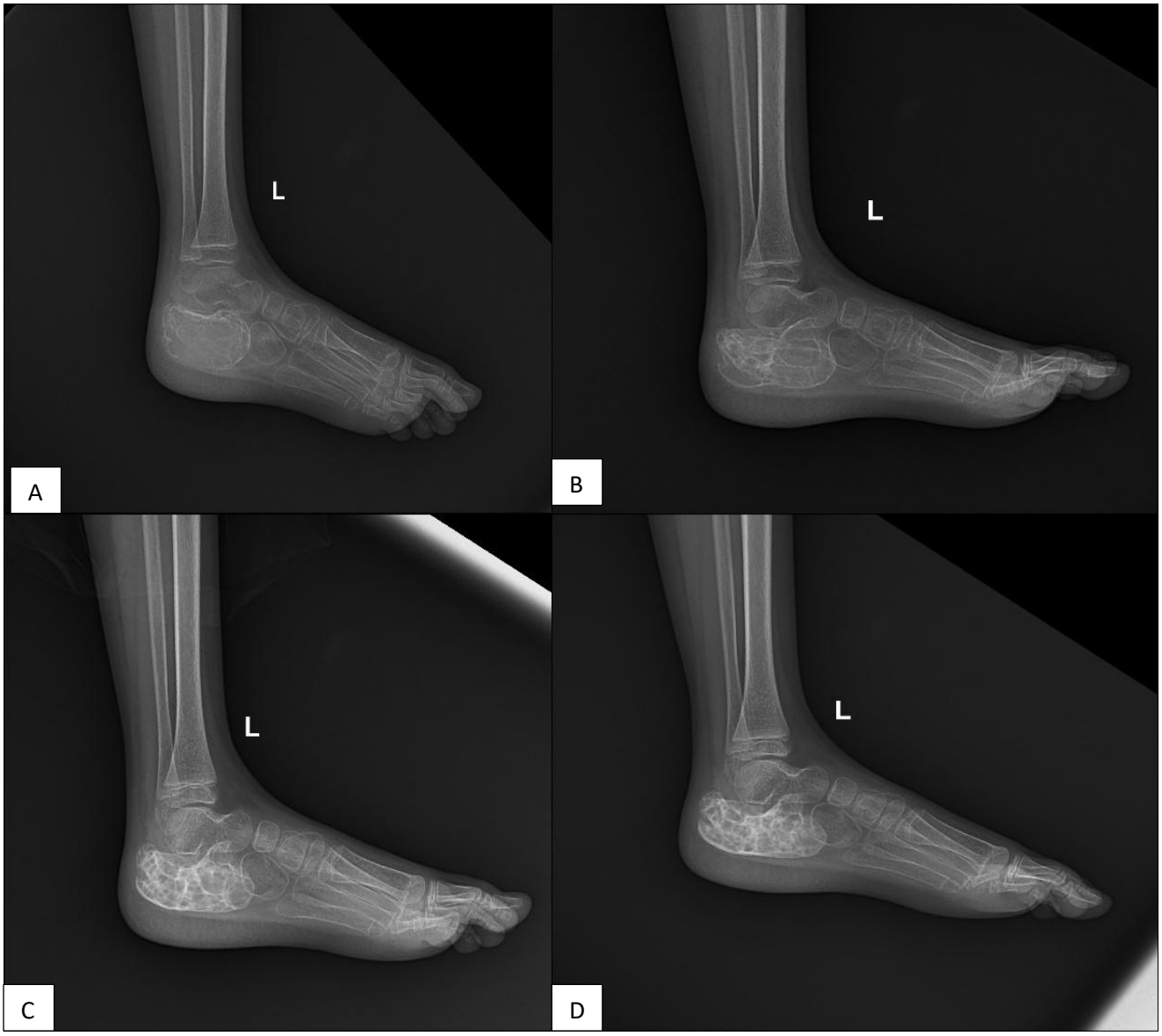

Figure 7 (A-D): A-Xray after 1st injection, B-X-ray after 2nd injection, C-Xray after 3rd injection and D-Xray after 4th injection.

DISCUSSION

In our department of pediatric orthopedics, we have operated on several ABCs on different locations of bone, but never encountered one in the calcaneus, which supports paucity of literature regarding it. As we discussed earlier, less than 50 cases of primary calcaneus ABC were reported till date, a very small portion of them was treated with sclerosant injection, and the rest were treated with extended curettage and bone grafting.[1,7-12] As our patient was a 5 year old female child and almost the entire calcaneus was affected by a cyst resulting in a thin wall, we tried a less morbid procedure which was sclerosant injection. Polidocanol is a widely used sclerosant agent which is used in treatment of ABC nowadays. Its mechanism of action primarily revolves around its ability to cause endothelial damage, leading to vein sclerosis and eventual obliteration of the targeted vascular structures. The surfactant action of polidocanol leads to the denaturation of proteins and lipids in the cell membrane. This denaturation process causes cell membrane damage and loss of cellular integrity. The endothelial cells, being particularly sensitive to such damage, begin to swell and rupture, leading to cell death. Then it forms blood clots and then it turns into fibrosis over time. The concentration we use is also important to treat ABCs.

After 4 sequential injections of polidocanol, the patient was fit, no signs of recurrence or any adverse effect after giving polidocanol was noted. In our patient there was no sign of recurrence even after 1 year of completing the last injection.

Limitations of this study being it is a single case; absence of standardized outcomes; no cross-sectional imaging post treatment and short follow-up.

CONCLUSION

Primary aneurysmal bone cysts of the calcaneus are extremely rare in early childhood. This case highlights successful management of a large, thin-walled calcaneal ABC using serial polidocanol sclerosant injection, avoiding the morbidity of curettage and grafting. At one-year follow-up, the patient demonstrated radiographic healing and full resolution of symptoms without recurrence. Larger studies are needed to establish optimal dosing protocols and long-term outcomes.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not Required

REFERENCES

1. Madani H, Hassnaoui Y El, Benali HA, Shimi M. Aneurysmal bone cyst of the calcaneus: A rare case report and review of the literature. Int J Surg Case Rep. 2024;119:109802.
2. GoÂmez J, Pinar A, Vallcanera A, Moreno A, Cortina H. Sonographic findings in aneurysmal bone cyst in children: correlation with computed tomography findings. J Clin Ultrasound. 1998;26(2):59-64.
3. Oommen AT, Madhuri V, Walter NM. Benign tumors and tumor-like lesions of the calcaneus: a study of 12 cases. Indian J Cancer. 2009;46(3):234.
4. Rastogi. S, Varshney MK, Trikha V, Khan SA, Choudhury B, Safaya R. Treatment of aneurysmal bone cysts with percutaneous sclerosant injection using polidocanol A Review Of 72 Cases With Long-Term Follow-Up. J Bone Joint Surg. 2006;88-B:1212-6.
5. Deventer N, Toporowski G, Gosheger G, De Vaal M, Luebben T, Budny T, et al. Aneurysmal bone cyst of the foot: A series of 10 cases. Foot Ankle Surgery. 2022;28:276-80.
6. Brosjö O, Pechon P, Hesla A, Tsagozis P, Bauer H. Sclerosant injection with polidocanol for treatment of aneurysmal bone cysts. Acta Orthop. 2013;84(5):502-5.
7. Jalan D, Gupta A, Elhence A, Nalwa A, Bharti J, Elhence P. Primary aneurysmal bone cyst of the calcaneus: A report of three cases and review of literature. The Foot. 2021;47:101795.
8. Pal C, Raju RPR, Meda A, Pulimi N, Kumar YK, Mazhar C. A Rare Case of Aneurysmal Bone Cyst of Calcaneus: A Case Report. J Orth Joint Surg. 2024;6(2):190-92.
9. Mohan NS, Khuntia S, Shivakumar YS. "An Unusual Case of Aneurysmal Bone Cyst of the Calcaneus: A Case Report". J Evolution Med Dental Sci. 2014;3(16):4363-6.
10. Deventer N, Schulze M, Gosheger G, de Vaal M, Deventer N. Primary Aneurysmal Bone Cyst and Its Recent Treatment Options: A Comparative Review of 74 Cases. Cancers. 2021;13:2362.
11. Casadei R, Ruggieri P, Moscato M, Ferraro A, Pieci P. Aneurysmal Bone Cyst and Giant Cell Tumor of the Foot. Foot Ankle Int. 1996;17:8.

Cite this article as: Paik S, Bose T, Bhowmik S. Primary calcaneal aneurysmal bone cyst in a 5-year-old treated with serial polidocanol sclerotherapy: a case report. Int J Res Orthop 2026;12:520-5.