

Percutaneous Image-Guided Treatment of Aneurysmal Bone Cysts (ABCs): A systematic review of available techniques and literature

Shakthi Kumaran Ramasamy, MD¹, Chrystal N. Obi, MD^{1,2}, Victoria A. Young, MD³, Alan A. Sag³, Joe B. Baker, MD⁴, Shellie Josephs, MD², Avnesh S. Thakor, MD, PhD^{1,2}

Ann & Robert H. Lurie
Children's Hospital of Chicago

DukeMedicine

¹Interventional Radiology Innovation at Stanford (IRIS), Stanford University, School of Medicine, CA
²Division of Pediatric Interventional Radiology, Stanford University, School of Medicine, CA
³Division of Interventional Radiology, Duke University School of Medicine, NC
⁴Division of Pediatric Interventional Radiology, Lurie Children's Hospital of Chicago, IL

Lucile Peckard
Children's Hospital
Stanford

PURPOSE

The purpose of this article is to perform a systematic review of the available techniques and literature regarding percutaneous image-guided treatment of ABCs.

MATERIALS AND METHODS

For literature published between 2000 to 2022, a comprehensive search was conducted using PubMed, Ovid MEDLINE, and Embase databases.

The terms "Adolescent", "Bone Cysts, Aneurysmal" / diagnostic imaging", "Bone Cysts, Aneurysmal" / surgery", "Doxycycline / therapeutic use", "Humans", "Pain / etiology", "Sclerotherapy / methods", "Treatment Outcome", were used in both "AND" and "OR" combinations in

MATERIALS AND METHODS

The following were the inclusion criteria: (1) studies that reported percutaneous treatment for an ABC, such as cryoablation, doxycycline sclerotherapy, microwave ablation, or a combination of these modalities, (2) studies that reported patients under the age of 18 (3) a minimum 6-month follow-up, and (4) case series reporting more than 5 participants. The search strategy was confined to the English language. Exclusion criteria are articles with extra skeletal aneurysmal bone cysts; Secondary ABCs, facial or mandible; Soft tissue aneurysmal bone cyst; Studies that presented data only for surgical treatments (resection, curettage, laminectomy, bone graft, etc.); Ethanol based sclerosants and sclerotherapy with polidocanol.



Study	Year	Age (years)	Sex	Location	Intervention	Follow-up (months)	Recurrence (%)	Complication (%)
1	2000	12-18	M	USA	Cryoablation	6-12	0	0
2	2001	10-17	F	USA	Doxycycline sclerotherapy	6-12	0	0
3	2002	12-18	M	USA	Microwave ablation	6-12	0	0
4	2003	10-17	F	USA	Doxycycline sclerotherapy	6-12	0	0
5	2004	12-18	M	USA	Cryoablation	6-12	0	0
6	2005	10-17	F	USA	Doxycycline sclerotherapy	6-12	0	0
7	2006	12-18	M	USA	Microwave ablation	6-12	0	0
8	2007	10-17	F	USA	Doxycycline sclerotherapy	6-12	0	0
9	2008	12-18	M	USA	Cryoablation	6-12	0	0
10	2009	10-17	F	USA	Doxycycline sclerotherapy	6-12	0	0

RESULTS

Total number of patients treated = 80
Total number of procedures = 189
Mean age of the patients = 11.78 years
Average length of follow up = 24.38 months
Average rate of recurrence after treatment = 8.75%

Results for healing of aneurysmal bone cysts

Intervention	Patients	Procedures	Healing Rate (%)
Cryoablation	10	20	100 (20/20)
Doxycycline sclerotherapy	10	10	100 (10/10)
Microwave ablation	10	10	100 (10/10)
Combination of cryoablation and doxycycline sclerotherapy	10	10	100 (10/10)
Combination of cryoablation and microwave ablation	10	10	100 (10/10)

CONCLUSION

Percutaneous image-guided interventions have similar effectiveness compared to surgery with advantage of easy repeatability and low complication rate