Efficacy of Intra-Lesional Bleomycin Sclerotherapy for the Treatment of Hemangioma-Case Report

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Authors’ contributions
This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Vascular anomalies are one of the challenging diseases to manage, presenting in different age groups and with varied clinical course, of which hemangiomas are common which are vasoproliferative neoplasms and can occur in any organ. Depending on the age at presentation they are classified as congenital and infantile hemangiomas. Not much attention has been paid regarding the imaging and treatment modalities of vascular malformations particularly hemangiomas due to scarcity of literature related to this condition. Majority of these vascular malformations are self-limiting, but in a few cases these lesions may grow with age which can be treated surgically or by sclerotherapy which has been the safe, less invasive, economical and easily available modality for treating hemangiomas. Bleomycin is the main sclerosing agent used which is a cytotoxic anti-tumor antibiotic which was later found to have anti-cancer properties. In our case, a 9 year old male child presented to our institution with a lump in the left side of abdomen since birth. Contrast enhanced CT abdomens was suggestive of a vascular malformation. Patient was treated with sclerotherapy with intralesional bleomycin for which good results were noted by decrease in the size and vascularity of the swelling.

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1. INTRODUCTION

Vascular malformations and hemangiomas are hamartomas that are grouped into a class of benign tumors and can be found anywhere in the body. Virchow was the first to categorize vascular anomalies based on histologic features [1]. Later Mulliken and Glowacki proposed biologic classification based on clinical presentation, histopathologic features [2]. The prevalence varies in different age groups being 2% in neonates (increased prevalence in preterm neonates), upto 10% till the age of 1 year. These lesions are more common in infancy and childhood. Simultaneously multiple organs may be involved including hepatic, pulmonary, mediastinal, gastrointestinal, cerebral hemangiomas. These lesions are benign comprising of irregularly arranged vascular tissues. Hemangiomas are characterised by rapid proliferation of endothelial cells. The etiology of hemangioma remains unknown. Three phases were noted in the evolution of hemangioma namely rapid proliferating phase, involuting phase and involuted phase [3]. The clinical course, severity and complications of the condition depends on the site of occurrence of the lesion like airway obstruction, visual disturbances. Although these lesions frequently resolve, in 5% of cases complications such as pain, ulceration, bleeding from local site, residual scarring is seen.

2. CASE REPORT

A 9 year old male child presented to our institution with a lump in the left side of abdomen since birth. As per the history given by parents, child had swelling over left side of abdomen since birth which was small in size comparable to the size of a lemon and was static till 6 years of age .The swelling had gradually increased in size since last 18 months and had attained the present size. Child also had history in difficulty in breathing since last 6 months.

On examination there is a single, oval shaped lump in the left side of abdomen occupying almost entire left half of abdomen measuring approximately 10*5 cm, soft in consistency with well demarcated margins, moving with respiration, skin over the swelling is erythematous, surrounding skin is normal (Fig.1). USG abdomen was done suggestive of lymphatic malformation and was advised for CT abdomen.

Contrast enhanced CT abdomen was done suggestive of large extensive subcutaneous lesion on the anterior abdominal wall suggesting possibility of lymphatic malformation, second possibility of slow flow thrombosed vascular malformation.

Fig. 1. Showing huge lump occupying left half of abdomen with an erythematous surface

Interventional radiologist opinion was taken for further management and was advised intralesional bleomycin sclerotherapy. After obtaining informed consent from the parents, treatment using Bleomycin injection was decided as the first treatment option. Bleomycin injection was performed under local anesthesia. Procedure was uneventful. Patient was given analgesics after the procedure for control of pain and fever. Evaluation of treatment results were carried out in subsequent follow up sessions. Fortunately, patient had improved with a single session of bleomycin injection which was evidenced by decrease in the size of the swelling. It was also noticed that the swelling had faded after bleomycin injection. An apparent color change was noted from red to grey during the resolving phase of hemangioma (Fig. 2). Further follow up sessions were conducted for next 3 consecutive months which showed that there is no increase in the size of the hemangioma. Parents were well satisfied with the results of the treatment.

3. DISCUSSION

Vascular anomalies are classified into vascular tumors and malformations based on cellular
kinetics and clinical presentation. Vascular
tumors are known for endothelial hyperplasia
whereas vascular malformations occur due to
venous dysmorphogenesis with normal
endothelial turnover [4]. Vascular malformations
are classified in 5 different varieties based on the
type of affected tissue namely capillary,
lymphatic, venous, arteriovenous malformations
and a combination of these varieties [5]. Among
these, venous malformations are reported to be
the most common type which arise due to
venous dysmorphogenesis. They exhibit a
stagnant blood flow leading to thrombosis, due to
which patient presents with complaints of
excessive tissue growth, pain, discoloration of
skin [6]. The clinical presentation depends on the
location involved.

Fig. 2. Showing decrease in the size and
vascularity of the swelling after intralesional
bleomycin sclerotherapy with minimal
hyperpigmentation (a minor complication)

Hemangiomas are the most common benign
tumors of soft tissues in infancy and childhood.
The most commonly affected sites include head
and neck, followed by trunk and extremities.
Conrad Pienaar et al treated hemangiomas with
intralesional bleomycin injection which act on S0
stage of cell cycle and inhibit cellular proliferation
[7]. The angiogenesis of hemangiomas are well
modulated with bleomycin injection evidenced by
change in colour of the lesion from red to purple
or grey after treatment.

Different modalities of treatment were proposed
depending on the site affected, size of lesion.
Mulliken et al. proposed surgical intervention by
circular excision with purse-string suturing [8].
But this method was proved to be ideal modality
of treatment in small lesions on the face, or large
lesions in any other site on the body. However
large and especially facial lesions cause
considerable anxiety and worry among the
parents during which surgical excision could be a
demanding modality with questionable aesthetic
results. On the other hand, sometimes
hemangiomas may affect vital structures like lips,
eyelids, nose. Zide et al reported the need for the
surgery in case of disfiguring lip hemangiomas
highlighting the difficulty in using surgery as the
primary modality of treatment [9]. Although
surgical results are impressive, there is a
considerable risk of scar burden.

Intralesional bleomycin can be given at any age
and stage of hemangioma with a good response
rate. Bleomycin should be injected during the
proliferative phase of hemangioma affecting the
natural phenomenon of increase in the size of
the lesion during the first year of life [10]. Size of
the lesion had not seemed to affect the treatment
result with intralesional bleomycin injection.

Various sclerotherapy agents are used for the
treatment of venous malformations like
bleomycin, acetic acid, OK-432, doxycycline [11].
Bleomycin is a cytotoxic, glycoprotein antibiotic
isolated from Streptomyces verticillus by
Dr. Umezawa in Tokyo [12]. It has been used in
the treatment if vascular malformations and
hemangiomas due to its sclerosing effect on
endothelial cells (similar to alcohol or sodium
tetradecyl sulphate) and anti-neoplastic
effect (apoptotic effect on rapidly growing cells)
by inhibiting DNA synthesis [13]. It has also been
shown to be more effective in the treatment
cystic type of hygromas. The lesions should be
evacuated as much as possible before injecting a
sclerosant to ensure an effective contact
between the sclerosant and the endothelial lining
of the lesion [14]. The advantage of this
sclerotherapy is that it doesn't leave a scar tissue
and is easily available at a cheaper cost and high
success rate besides the risk of minimal toxicity
due to the drug. The dosage of the drug is
decided based on weight of the child and size of
the lesion. The disadvantages of the
sclerotherapy is that in case of very large lesions
child needs multiple general anesthetics and
hospital admission. Other less common
complications include hypopigmentation and
superficial scarring. Pulmonary fibrosis is a major
complication reported with high doses of
bleomycin injection [15]. It is reported that total
dose must not exceed 5mg/kg especially in
infants. Hence intralesional bleomycin injection is
a simple modality of treating hemangiomas and
other vascular malformation although completion of treatment may take a few months in case of huge hemangiomas.

4. CONCLUSION

Our study concludes that intralesional bleomycin appears to be a safe, economical and effective modality of treating vascular malformations like hemangiomas alternative to surgical treatment. However follow up is required to identify recurrences. Hence this modality of treatment is used in case of large lesions and lesions at sites where surgical resection is difficult with better cosmetic care.

DISCLAIMER

The products used for this research are commonly and predominantly used products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

As per international standard, parental written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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