

The Results of Surgical Treatment for Patients With Venous Malformations

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Background: The objective of this study was to estimate the outcomes of surgical treatment for patients with venous malformations (VMs).

Methods: We retrospectively reviewed the data of 48 patients who underwent surgical management for VMs from 1994 to 2009 at our institute. The 1-year responses to surgeries were classified into three groups based on the results: "remission," "improvement," and "no change."

Results: The indications of surgeries were mass or swelling in 48 patients (100%), intractable pain in 11 (23%), limb length discrepancy in seven (15%), bleeding in three (6%), and limitation of the range of motion in one (2%). The locations of the VMs were head and neck in 17 patients (35%), abdomen and pelvis in one (2%), perineum and genitalia in three (6%), upper extremities in 12 (25%), and lower extremities or buttocks in 15 (31%). Of the 48 surgeries for radical excision and debulking, 25 (52%) resulted in remission, 11 (23%) in improvement, and 12 (25%) in no change. During follow-up (mean: 44.8 ± 36.6 months, range: 0–111 months), recurrence after radical excision occurred in 10% (3 of 31) of the patients, and size increase after debulking surgery in 24% (4 of 17) of the patients.

Conclusions: Surgical treatment can be an option in patients with VMs, especially with symptoms that cannot be managed with conservative therapy or sclerotherapy. After excisional or debulking surgery in patient with VMs, remission or improvement can be observed in 75%.

INTRODUCTION

Treating congenital vascular malformation (CVM) is challenging. The treatment options for CVM are sclerotherapy, embolization, and surgical excision. Excessive surgery of extensive CVMs results in poor outcomes. Endovascular therapy with sclerotherapy is now accepted as a treatment of choice, especially for lesions with diffuse involvement or those that are unresectable. This treatment modality is preferred over surgical resection owing to the poor outcome of the latter and the high rate of surgery-related morbidities. However, we often encounter patients with surgically resectable CVMs or patients with

symptoms that cannot be managed with conservative therapy or sclerotherapy. Nevertheless, the results of the surgical resection of venous malformations (VMs) are not well known, and the decision for surgically debulking an extensive VM is difficult because of the lack of evidence supporting surgical treatment for VMs. We would like to report the outcomes of surgical treatment for patients with VMs.

MATERIALS AND METHODS

We retrospectively reviewed the data of 1,093 patients who were treated for VM at our institution between November 1994 and December 2009. We found 82 patients who underwent surgical management for VM, and we excluded 34 marginal vein (lateral embryonic vein or lateral venous anomaly) excisions with or without varicosectomy because their results were reported previously.¹ Finally, 48 surgical treatments with radical excision and debulking surgery were included in this study. The data on the patients and lesion characteristics were collected. The lesion

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Table I. Criteria for the evaluation of surgical treatment

Remission	Maximal diameter reduction to 0 cm on magnetic resonance imaging or No residual lesion on the medical photos
Improvement	Maximal diameter reduction >50% on magnetic resonance imaging or Definite size reduction on the medical photos
No change	Maximal diameter reduction <50% on magnetic resonance imaging or No definite size reduction on the medical photos

Table II. The clinicopathologic characteristics of all the registered venous malformation (VM) patients ($n = 1093$) and the patients who underwent surgery ($n = 48$)

Characteristics	All VM Patients $n = 1093$ (%)	VM patients who underwent surgery $n = 48$ (%)
Age, median (range)	18.0 (0–71) yr	8.1 (0–58) yr
Male	489 (45)	24 (50)
Location		
Head and neck	264 (24)	17 (35)
Abdomen and pelvis	29 (3)	1 (2)
Perineum and genitalia	6 (1)	3 (6)
Upper extremities	155 (14)	12 (25)
Lower extremities or buttocks	384 (35)	15 (31)
Multiple	255 (23)	—
Depth		
Subcutaneous layer	325 (30)	27 (56)
Muscle	624 (57)	19 (40)
Bone or viscera	144 (13)	2 (4)
Hamburg classification		
Predominantly venous defects	935 (86)	34 (71)
Extratruncular forms	910 (83)	32 (67)
Infiltrating, diffuse	637 (58)	14 (29)
Limited, localized	273 (25)	18 (38)
Truncular forms	35 (3)	2 (4)
Aplasia or obstruction	12 (1)	—
Dilation	13 (1)	2 (4)
Combined vascular defects (venolymphatic)	158 (14)	14 (29)
Extratruncular forms	157 (14)	14 (29)
Infiltrating, diffuse	93 (9)	7 (15)
Limited, localized	64 (6)	7 (15)
Truncular forms	1	—
Aplasia or obstruction	—	—
Dilation	1	—
Treatment		
None or conservative therapy	669 (61)	—
Sclerotherapy	342 (31)	16 (33)
Surgery	82 (8)	48 (100)
Radical excision	31 (3)	31 (65)
Debulking	17 (2)	17 (35)
Marginal vein resection	34 (3)	—

characteristics included the distribution, size, depth, and Hamburg classification.²

The decision for performing surgical treatment was made by a multidisciplinary approach. The

multidisciplinary team comprised vascular surgeons, cardiologists, intervention radiologists, plastic surgeons, otorhinolaryngologists, and orthopedic surgeons. The interdisciplinary consultation

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