The Role Of Purse String Closure As The Primary Treatment Of Hemangioma

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Background: Hemangioma is a common congenital disorder which happens in neonates or infant, with predilection sites in the face and neck. Not every case of hemangioma requires a surgical treatment. Some will regress spontaneously. In some cases which requires resection, the aesthetic aspects of the repair must be considered as the sites of the lesion involved the face and neck areas, which is greatly exposed.
Methods: Two patients with hemangioma of the left cheek were admitted to Plastic Surgery Department of Cipto Mangunkusumo Hospital. The patients underwent excision and primary closure with purse string technique. Patients were evaluated at one week after surgery and a month after to assess scar appearance.
Result: Follow up evaluation revealed less visible scar compared to the immediate result.
Conclusion: A well-known technique used by many plastic surgeons is the circular incision followed by purse-string closure. The use of this technique was known to produce less visible scar. Hemangiomas acts as a tissue expander, which make it applicable to close the defect using purse string closure
Keyword : *hemangioma, excision, purse-string closure, tissue expander*

Latar Belakang: Hemangioma adalah kelainan kongenital yang umum terjadi pada neonatus dan balita dengan area predileksi pada leher dan wajah. Tidak semua kasus hemangioma membutuhkan terapi pembedahan. Beberapa akan mengecil secara spontan. Dalam beberapa kasus yang membutuhkan reseksi, hasil akhirnya secara estetik harus sangat diperhatikan mengingat letak lesi di wajah dan leher.
Metodologi: Dua pasien dengan hemngioma di pipi kiri datang ke RSUPN Cipto Mangunkusumo. Dilakukan eksisi kemudian ditutup dengan teknik *purse string*. Kedua pasien lalu dievaluasi satu minggu pascaoperasi dan satu bulan setelahnya untuk evaluasi parut dan hasil operasi secara estetik.
Hasil : Evaluasi menunjukkan parut yang tidak menonjol dibandingkan hasil pascaoperasi langsung.
Kesimpulan: Teknik yang cukup banyak digunakan oleh ahli bedah plastik adalah insisi sirkular diikuti penutupan defek dengan teknik *purse-string*. Penggunaan teknik ini menghasilkan parut yang baik dan tidak menonjol. Hemangioma mempengaruhi jaringan sekitar seperti *tissue expander*,yang mengakibatkan defek dapat ditutup dengan teknik *purse string.*
Kata Kunci *: hemangioma, excision, purse-string closure, tissue expander*

Hemangioma is a common congenital disorder in children.[1] It is usually formed in the facial region thus producing a bad cosmetic appearance and causing great distress to parents. Some hemangiomas will underwent involution so some surgeons prefer to do "watchful waiting" as the primary treatment and revising the scar left by the hemangioma as an alternative. However hemangiomas which cause functional disturbance of aesthetically disturbing can be excised. The goal of the excision of hemangioma is to produce minimally

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Presented in The Forteenth Annual Scientific Meeting of Indonesian Association of Plastic Surgeon. Balikpapan, East Kalimantan. Indonesia.

Disclosure: *The authors have no financial interest to declare in relation to the content of this article.*

scar. A well-known technique used by many plastic surgeons is the purse-string closure. [1,2]

Case 1

The first patient was a 15 months old female patient admitted to Plastic Surgery Department of Cipto Mangunkusumo Hospital with a 4x3x0,1 cm hemangioma of the left cheek (Figure 1) The patient was born with a red dot on the left cheek, the red dot increase in size and causing tension in the infraorbital region and the edge of the lips.

The hemangioma on the patient's cheek was excised in a circular fashion and the defect was closed using a purse string technique with absorbable suture (vicryl 4-0). (Figure 2).

Figure 1. Preoperative appearance of the patient revealing a 4 x 3 x 0,1 cm superficial hemangioma of the left cheek. The tumor caused deformity in the left edge of the lips.

Figure 2. Intraoperative images of the patient showing the defect after the circular excision and immediate intraoperative result of the defect after closed using purse-string technique.The last picture shows the result of surgery two weeks after the operation.

The patient was further evaluated at two weeks after the surgery. The scar has not shown significant reduction but the level of the pleats caused by the purse-string technique has been reduced and the notching of the lips due to the tension of the closure has subsided. Further evaluation was needed to assess the degree of healing and the resulting scar.

The second patient was a 11 months old male patient with a 3x4x1 cm hemangioma of the left cheek.(see fig.3) He has a red notch on the left cheek since birth, which grows bigger in time. The parents were concerned with the growth of the tumor and demand an excision. Patient underwent excision and primary closure with purse string technique using vicryl 3-0. Patients were evaluated at one week and one month after surgery to assess scar appearance. (see fig.4)

Figure 3. (upper left) Preoperative view of the 3 x 4 x 1 cm hemangioma of the left cheek. (upper right) Intraoperative view of the hemangioma after a circular excision was performed. (lower left and right) immediate postoperative view of the patient after a purse-string closure, note the tension on the left side of the lips.

DISCUSSION

Hemangiomas are the most common tumors in neonates and infants, which occurs mostly in the head and neck.[1] It comprises 0.5% of head and neck tumors. There are two types of hemangioma, namely capillary and cavernous hemangioma.[3] Some others suggest the third type of hemangioma, which is the mixed-type hemangioma.[4] The main difference lies in the vascular lumina and the thickness of the

Figure 4. One month post operative view of the purse-string closure. Note the reduced tension on the side of the lips and the pleats of the purse string has subsided.

vessel wall, in which cavernous hemangioma have larger lumina and thicker vessel wall.[3,4] Another difference is the depth of penetration.

The pathogenesis of hemangioma consists of several theories. Folkmann proposed that hemangiomas depend on angiogenesis.[5] Takahashi and colleagues used immunohistochemistry to determine the three phases of hemangioma, ra-pid proliferation, involution and involuted. [5]

Hemangioma is differentiated from other forms of vascular malformations using the Mulliken and Glowacki classification.[3] Hemangiomas are defined as vascular lesions that appear in the neonatal period, demonstrate proliferative and involutional growth pattern, and whose endothelial cells exhibit increased mitotic activity during proliferation period.

Diagnosis of hemangioma is usually made clinically. It appears as a raised, mobile, erythematous mass on the skin beginning at birth or soon after birth. Another characteristic is rapid proliferation during early childhood, with or without subsequent involution. Hemangiomas which occur in deep seated tissue requires diagnostic tools such as CT or MRI with contrast.

The treatment of hemangiomas should consider the nature of the disease, which is self-involution. The majority of cutaneous hemangiomas will undergo self-involution, it usually regresses to 50% at the age of 5 years, 70% at the age of 7 and 90% at the onset of puberty. [4] Physicians should reassure concerned parents about the ability of hemangiomas to reduce spontaneously. However there are definite indications for surgical treatment for hemangiomas which include obstruction, deformation, ulceration, coagulopathy, and congestive heart failure. Other considerations of surgical treatment or the relative indication for treatment is hemangiomas in troublesome areas of the face namely in the periorbital and subglottic region, which demands immediate operation.

Other location requires non-emergency treatment. Other treatment modalities currently used for cutaneous hemangiomas include yellow light lasers, corticosteroids and recently interferon alpha for its anti-angioenic potential. Small facial hemangiomas can be controlled using a series of intralesional corticosteroid injections. The indication for excising hemangiomas without any definite indication, especially in the involuting phase, is still controversial.[5] However, this case report will not discuss the treatment options or the timing of operation.

The target of hemangioma excision is to leave the smallest possible scar with minimal distortion of the surrounding structures. The conventional method of excising hemangioma is the lenticular excision, which will leave a scar longer than the scar that will be obtained when the tumor has regressed fully. Hemangiomas act as a tissue expander, which will make loose skin after the excision and make it possible to close the remaining defect using a purse string technique. This technique will leave a smaller scar and make further revision easier. [6]

Circular excision and purse string closure is applicable to hemangiomas in the facial region, where the skin is loose enough to be closed in this fashion.[6] The diameter of hemangioma in the study by Mulliken, et al (2001) is 2,4 cm. A bigger hemangioma will produce a defect too large to be closed using this technique without producing distortion to the normal facial structures. The excisional to lesional length is less than 3 : 1.

Another important aspect which need to be reviewed when using this technique is the patient's parents consent. Care must be given in explaining that it might not be a one staged procedure. Future revision of the scar might be needed.

CONCLUSION

Hemangiomas are the most common benign vascular tumor which may need surgical intervention. Circular excision and primary closure using purse-string technique is an alternative technique for excision of hemangiomas which may be applied to hemangiomas in the facial region. This technique will leave smaller scar and make it easier for further revision. Further studies is needed to observe the outcome of this technique in Indonesian population.

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Acknowledgement
We gratefully thank Donna Savitry, MD for his assisstance in reviewing this article and Nandita M Putri for basic editing and proof-reading.

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