

The Woodward technique for Sprengel deformation

Marcelin Ngowe Ngowe,¹

Ibrahim Farikou,¹

Faustin Félicien Mouafo Tambo,¹

Bernadette Ngo Nonga,¹

Gervais Ondobo Andze,²

Maurice Aurélien Sosso¹

¹General Surgery, Faculty of Medicine and Biomedical Sciences (FMBS), University of Yaoundé I; ²Pediatric Surgery, Yaoundé Gyneco-Obstetric and Pediatric Hospital, Cameroon

Abstract

A case of 5-year-old boy with a left congenital undescended scapula graded Cavendish III was consulted in our unit and operated successfully with the Woodward technique. It was the first case treated by this procedure for the past 10 years, in the Pediatric Surgical Unit of the Yaounde Gyneco-Obstetric and Pediatric Hospital (Cameroon). The Woodward procedure permitted to obtain a good functional and cosmetic result.

Introduction

Sprengel deformity is a congenital abnormality usually occurring during gestation (8-11 weeks of gestation), affecting girls in 75% of cases, and being unilateral in 90% of cases. In severe cases it causes limited shoulder abduction.¹ Several surgical methods have been defined for the surgical treatment of congenital elevation of the scapula, among them the Woodward technique first described in 1961.^{2,3} This procedure appeared to be easily applied in our milieu, and was applied for our case report.

Case Report

A 5-year-old boy was addressed to our surgical unit for asymmetry of the shoulders noted since 2 months age. He presented with a left sided mass of the neck, a deviation of the head towards the left (Figure 1).

The level of superomedial border of the left scapula was elevated up to the seventh cervical vertebrae while it was normal for the right scapula, with a limitation of the left shoulder abduction that was 75°. The cervicothoracic scanner revealed an elevated left scapula and an omovertebral bone at the level of the sev-

enth cervical vertebrae. The diagnosis of Sprengel deformity graded Cavendish III was retained and the patient elected for corrective surgery through the Woodward procedure.

Surgery was carried out under general anesthesia. The young patient was placed in a semi prone position on the operating table with the affected side uppermost. The operative field released the back from the neck until the iliac spines, the two shoulders and the high part of the arms; the left arm was draped separately to allow manipulations during the procedure, so as to test the scapular belt movements. Incision was first drawn with a marker, same for osseous prominences. Skin incision was vertical, made inner the medial border of the scapula, extended from the fourth cervical vertebrae to the tenth thoracic vertebrae (Figure 2).

After sub cutaneous dissection, extrape-riosteal excision of the trapezius muscle origin, small and large rhomboid muscles, was done. Levator scapulae muscle was divided upwards, after the spinal nerve was isolated and identified. To do this, we were obliged to extend our skin incision upwards and towards the left side of the neck base. Excision of omovertebral bone from the scapula was conducted by a careful dissection, dividing adhesions of this bone to the superomedial scapular border after retracting the transverse cervical artery. We didn't cut the superomedial scapular border because it was not prominent. The left scapula was then lowered using transportation and suturing of the origin of the trapezius muscle to the lower lev-

Correspondence: Marcelin Ngowe Ngowe, General Surgery, Faculty of Medicine and Biomedical Sciences (FMBS), University of Yaoundé I, Cameroon.

Tel. +237.9993.0972; +237.7721.6858.

E-mail: nkouki2002@yahoo.fr; ngowe@msn.com

Key words: Woodward technique, Sprengel deformation, surgical treatment, Cameroon.

Received for publication: 26 September 2011.

Revision received: 24 October 2011.

Accepted for publication: 19 December 2011.

This work is licensed under a Creative Commons Attribution NonCommercial 3.0 License (CC BY-NC 3.0).

©Copyright M. Ngowe Ngowe et al., 2012

Licensee PAGEPress, Italy

Surgical Techniques Development 2012; 2:e1

doi:10.4081/std.2012.e1

els over the spinous processes. The inferior pole of the left scapula was sutured to the latissimus dorsi muscle. Parietal closure was carried out layer by layer completed with local suction drainage. Surgery was completed with a thoracic sling put for four weeks and active physiotherapy. No local or systemic complications were seen. Six months later, our case that was Cavendish III improved to I. At the final follow-up, shoulder asymmetry was almost corrected (Figures 3 and 4), with an increase in abduction



Figure 1. Left Sprengel deformity.



Figure 2. Skin incision.



Figure 3. Cosmetic aspect before surgery.



Figure 4. Cosmetic aspect after surgery.



Figure 5. Left scapula abduction before surgery (abduction: 75°).



Figure 6. Left scapula abduction after surgery (abduction: 110°).

of 35°. Postoperative abduction was therefore 110° (Figures 5 and 6), a scar esthetically acceptable.

Discussion

Our patient was a 5 years old boy and presented no associate abnormality. The preoperative cervicothoracic scanner showed an omovertebral bone, all those reasons directed us towards a surgical procedure involving almost only soft tissues. We therefore choose the Woodward scapuloplasty that appeared easier and more rapid to us, taking in account our lack of experience for that kind of surgery. We were encouraged because of some good results of the surgical treatment in others studies in USA, Africa, Asia.^{4,5,6,7} We tried as far as possible to avoid scapula excision as

described with other procedures.⁸ To mobilize the scapula, omovertebral bone excision was done like Doita *et al.*, quoted by Gonen in Ankara, Turkey.⁹ Cosmetic and functional results were acceptable in our case; they were evaluated using the Cavendish scale.¹⁰ After a six-months follow-up, the patient was doing better, with a gain in abduction of 35°. We hope to obtain a best abduction increase around the first year of follow up with motion exercises.

Conclusions

We think that a properly applied Woodward procedure is a safe and easy method in the treatment of Sprengel deformity. It provides good functional and cosmetic results even in moderate skilled hands.

References

1. Mallet JF, Bronfen C. Malformations de la ceinture scapulaire chez l'enfant et l'adolescent. *Appareil locomoteur. Encycl Méd Chir* 2002;15-202-A-10:7.
2. Woodward JW. Congenital elevation of the scapula: Correction by release and transplantation of muscle origins. *J Bone Joint Surg Am* 1961;43:219-28.
3. Grogan DP, Stanley EA, Bobechko WP. The congenital undescended scapula. Surgical correction by the Woodward procedure. *J Bone Joint Surg Br* 1983;65:598-605.
4. Borges JL, Shah A, Torres BC, Bowen JR. Modified Woodward procedure for Sprengel deformity of the shoulder: long-term results. *J Pediatr Orthop* 1996;16:508-13.
5. Ismaël F, Ismaël MF, Draoui M, et al. Traitement chirurgical de la maladie de Sprengel. *Med Mag* 2006;140:7-14.
6. Lungu SG. Undescended scapula. *Med J Zambia* 2009;36:136-39.
7. Ahmad AA. Surgical correction of severe Sprengel deformity to allow greater postoperative range of shoulder abduction. *J Pediatr Orthop* 2010;30:575-81.
8. Andrault G, Salmeron F, Laville JM. Green's surgical procedure in Sprengel's deformity: cosmetic and functional results. *Orthop Traumatol Surg Res* 2009; 95:330-5.
9. Gonen E, Simsek U, Solak S, Bektaser B, Ates Y, Aydin E. Long-Term Results of Modified Green Method in Sprengel's Deformity. *J Child Orthop* 2010;4:309-14.
10. Cavendish ME. Congenital elevation of the scapula. *J Bone Joint Surg Br* 1972;54:395-408.