

Revisiting Gavello's procedure for single-stage reconstruction of the earlobe: The vascular basis, technique and clinical uses

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D Chattopadhyay, S Gupta, MB Murmu, G Guha, S Gupta. Revisiting Gavello's procedure for single-stage reconstruction of the earlobe: The vascular basis, technique and clinical uses. *Can J Plast Surg* 2012;20(2):22-24.

BACKGROUND: Deformities or loss of the earlobe may be congenital, or acquired due to trauma, bites, burns or tumour excision. A variety of single-stage and two-stage procedures have been described for earlobe reconstruction, of which Gavello's procedure was one of the earliest.

OBJECTIVE: To revisit Gavello's procedure with reference to the vascular supply of the flap, and discuss the relevance of the technique in current practice.

METHODS: The authors discuss the vascular basis of Gavello's flap, and describe the clinical application of the single-stage Gavello's procedure in diverse clinical situations, including congenital absence of earlobe, post-burn earlobe deformity and traumatic amputation of the earlobe.

RESULTS: Excellent cosmetic results have been achieved in all different clinical situations in the authors' experience, with preservation of earlobe shape and volume, good colour match and a well-concealed scar in the donor area.

DISCUSSION: Gavello's procedure is a simple, one-stage procedure that relies entirely on local tissue for earlobe reconstruction; the flap has a predictable vascular supply, skin grafting is not required and the procedure can be used for large defects. An intact donor area over the postauricular mastoid region is a prerequisite.

CONCLUSION: The simple, century-old Gavello's procedure is still of great value for reconstruction of earlobe defects of diverse etiology.

Key Words: Earlobe deformity; Earlobe reconstruction; Gavello's flap; Gavello's procedure

Deformities of the earlobe may be congenital, or acquired as a consequence of trauma, human or animal bites, burns or tumour excision. A variety of procedures for earlobe reconstruction, both one-stage and two-stage, have been described. The technique described by Gavello (quoted by Nélaton and Ombredanne, 1907 [1]) is one of the earliest and simplest and, in our opinion, this century-old technique merits revisiting for evaluation of its application in contemporary reconstructive surgery.

Gavello's procedure consists of outlining a horizontal bilobed skin flap in the postauricular mastoid region. The posterior flap is folded under the anterior flap, thus forming the posterior lining of the new earlobe. The resulting skin defect is closed by direct approximation (2). In the present article, we describe the Gavello procedure in detail, including its vascular basis and demonstrate excellent outcomes in three patients with earlobe deformity/loss due to diverse etiologies.

THE VASCULAR BASIS OF GAVELLO'S FLAP

The posterior auricular artery arises in the neck from the external carotid artery, and ascends between the auricle and mastoid process. It

Examiner l'intervention de Gavello en cas de reconstruction du lobe de l'oreille en une étape : la base vasculaire, la technique et les utilisations cliniques

HISTORIQUE : Les anomalies ou la perte du lobe de l'oreille peuvent être d'origine congénitale ou être acquises en raison d'un traumatisme, de morsures, de brûlures ou d'excision d'une tumeur. Diverses interventions en une ou deux étapes ont été décrites pour reconstruire le lobe de l'oreille. L'intervention de Gavello est l'une des plus anciennes.

OBJECTIF : Examiner l'intervention de Gavello compte tenu de la capacité vasculaire du lambeau et exposer la pertinence de cette technique dans la pratique actuelle.

MÉTHODOLOGIE : Les auteurs abordent la base vasculaire du lambeau de Gavello et décrivent l'application clinique de l'intervention de Gavello en une étape dans diverses situations, y compris l'absence congénitale de lobe d'oreille, une malformation du lobe de l'oreille après une brûlure et une amputation traumatique du lobe de l'oreille.

RÉSULTATS : Les auteurs ont remarqué d'excellents résultats esthétiques dans toutes sortes de situations cliniques, qui permettent de préserver la forme et le volume du lobe de l'oreille ainsi que d'obtenir une bonne correspondance de la couleur et une cicatrice bien cachée au foyer du donneur.

EXPOSÉ : L'intervention de Gavello est une intervention simple en une étape qui fait entièrement appel à des tissus locaux pour reconstruire le lobe de l'oreille. Le lambeau a une capacité vasculaire prévisible, la greffe de peau est inutile et l'intervention peut être utilisée pour des anomalies importantes. La région de la mastoïde postauriculaire du donneur doit être intacte.

CONCLUSION : L'intervention de Gavello, qui est simple et existe depuis un siècle, est toujours très précieuse pour la reconstruction d'anomalies du lobe de l'oreille d'étiologies variées.

supplies the cranial surface of the auricle via its auricular branch, and the occipital belly of occipitofrontalis and the scalp behind and above the auricle via its occipital branch (3). Our observation of digital subtraction angiography (DSA) images of different individuals undergoing DSA for unrelated causes revealed that the occipital branch of the posterior auricular artery that runs horizontally behind the ear is a constant vessel in the area where Gavello's flap is raised (Figure 1).

Description of the procedure: Figures 2A and 2B

A straight line (A-B) is drawn on the postauricular mastoid skin, along the cut margin of the earlobe. This line is further extended posteriorly to a point C, so that AB = BC. A point D is marked approximately 1 cm vertically below the point A. From point D, a double-curved line (D-E-C) is drawn, joining points D and C. The bilobed flap thus formed is raised by subcutaneous dissection with caution to avoid injury to the posterior auricular artery, which runs at the base (A-D) of the flap. The cut margin of the earlobe is paired and freshened. The bilobed flap is folded on itself along B-E. AB and BC are sutured with the anterior and posterior paired margins of the

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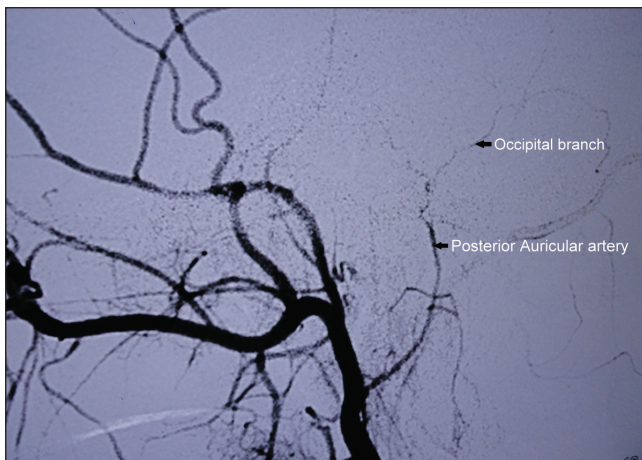


Figure 1) Digital subtraction angiography image demonstrating the occipital branch of posterior auricular artery

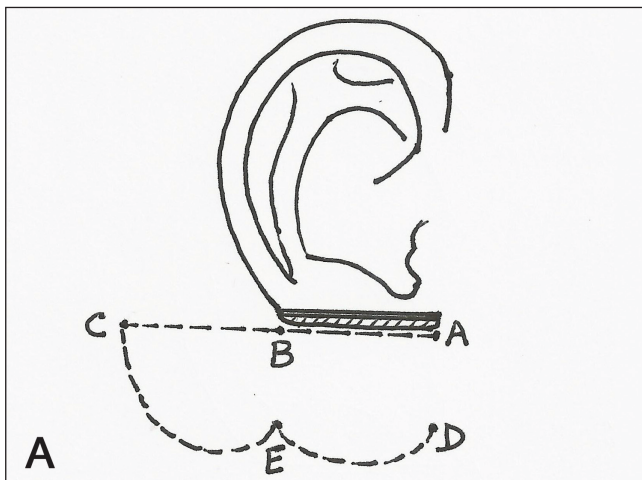


Figure 2) Design of the bilobed Gavello flap. A schematic drawing. B Preoperative marking

earlobe, respectively. The lower curved borders of the bilobed flap are sutured with one another to form the free margin of the new earlobe. The donor site defect is closed primarily after wide undermining. Sutures are removed after two weeks.

Clinical application and results

Case 1: A 19-year-old woman underwent earlobe reconstruction for congenital absence of left earlobe (Figure 3A) using the technique described above. The postoperative result is shown in Figure 3B.

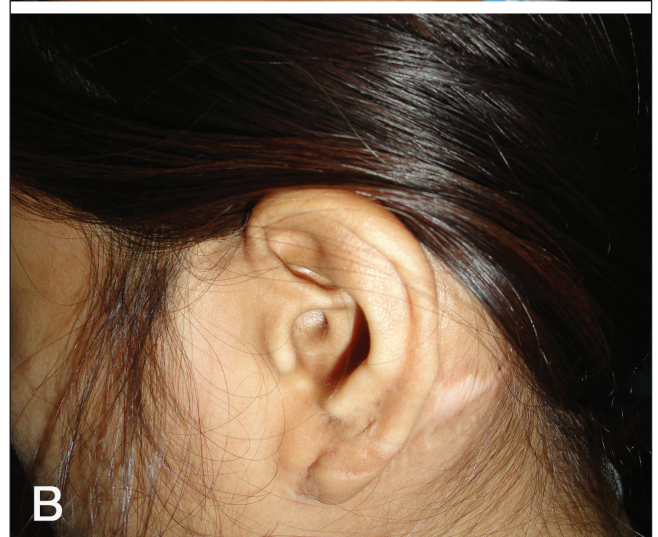


Figure 3) Results of Gavello's procedure in congenital absence of earlobe. A Preoperative photograph. B Postoperative outcome

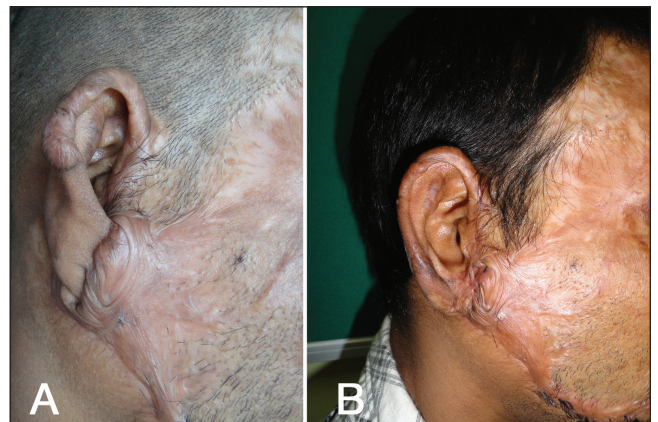


Figure 4) Results of Gavello's procedure in postburn earlobe deformity. A Preoperative photograph. B Postoperative outcome

Case 2: A 33-year-old man presented with postburn deformity of his right earlobe (Figure 4A). The deformed and extremely scarred earlobe was excised and a new earlobe reconstructed using the method described (Figure 4B).

Case 3: A 40-year-old woman experienced near total amputation of her left earlobe as a result of sharp-cut injury (Figure 5A). Reconstruction by Gavello flap yielded a satisfying result (Figure 5B).

DISCUSSION

The earlobe is a small but aesthetically crucial structure. The challenge in earlobe reconstruction surgery is to obtain a natural-appearing structure with a durable outcome. The technique should be simple, preferably performed in one stage, suitable for earlobe defects of all sizes and volume, and yield acceptable cosmetic results.

A variety of single-stage and two-stage reconstructive techniques have been described for earlobe reconstruction. These techniques mainly use local skin flaps from the preauricular, infra-auricular, retroauricular, retromandibular areas or the auricular surface, depending on the flap design: doubled-over single or bilobed flaps (1,2,4-10), superimposition of two opposing or paired flaps (11-14) or double-crossed flaps (15) may be used; some techniques require a skin graft in addition to the flap (6,16,17). Some of the procedures involve the incorporation of a cartilage graft into the reconstructed earlobe to maintain shape (18-20).

The advantages of the Gavello technique are as follows: it is a simple, one-stage procedure; it is suitable for both immediate and delayed reconstruction; it relies entirely on local tissue for reconstruction; the flap has a predictable vascular supply; skin grafting is not required; it yields excellent cosmetic results with preservation of earlobe shape and volume; excellent colour match; the donor site scar is well-concealed; and the procedure can be used for large defects or even total loss of earlobe, as shown in case 3 of the present series. The limitation of the procedure is the requirement of an intact donor area over the postauricular mastoid region.

CONCLUSION

In the present article, we revisited Gavello's procedure of earlobe reconstruction with an attempt to understand the vascular basis of the

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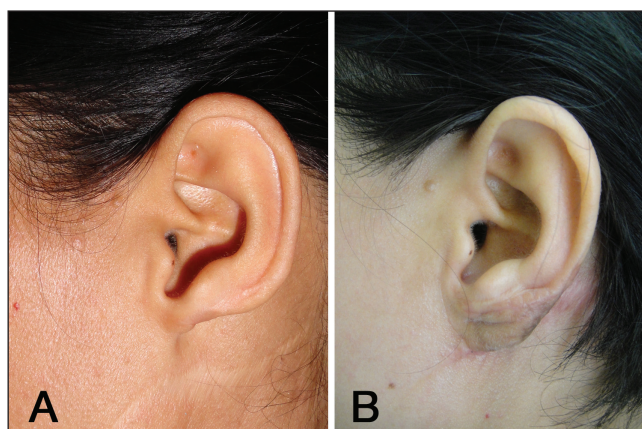


Figure 5) Results of Gavello's procedure in traumatic amputation of earlobe. **A** Preoperative photograph. **B** Postoperative outcome

procedure, and demonstrated the excellent results that can be achieved with this century-old technique for earlobe defects of diverse etiology. Thus, it can be concluded that such 'old', simple flaps are still of great value.

DISCLOSURES: The authors have no financial disclosures or conflicts of interest to declare.