

# Reconstruction of the ear using silicone fiber

## Reconstrução de defeito condrocútâneo auricular usando fibra de silicone

### ABSTRACT

Reconstructions of the auricular pavilion are complex, especially when there is a loss of cartilaginous support. A case of chondrocutaneous defect reconstruction, after the exeresis of a basal cell carcinoma in the upper third of the auricular pavilion, is reported. Silicone fiber was used to model and provide support for the ear. The technique of using cartilage or compound grafts in the auricular pavilion is described.

**Keywords:** ear cartilage; surgery, plastic; ear deformities, acquired; ear; prostheses and implants.

### RESUMO

Reconstruções do pavilhão auricular são complexas, principalmente quando há perda do suporte cartilaginoso. Relata-se caso de correção de defeito condrocútâneo após exérese de carcinoma basocelular no terço superior do pavilhão auricular, utilizando fibra de silicone com o objetivo de moldagem e sustentação da orelha. Demonstra-se opção do uso de enxertos de cartilagem ou compostos no pavilhão auricular.

**Palavras-chave:** cartilagem da orelha; cirurgia plástica; deformidades adquiridas da orelha; orelha; próteses e implantes.

### INTRODUCTION

Auricular pavilion reconstructions are complex due to the anatomic peculiarity of the region. Congenital and acquired deformations have stimulated the development of new techniques for centuries. Due to the risks and complexity of performing cartilaginous grafts, auricular molds made of synthetic materials (silicone, polyethylene, nylon mesh and Teflon, among others) were used in the 1960s and 1970s.<sup>1</sup> We report a case in which silicone fiber, often used in orthopedic surgeries, was used to mold and temporarily support the upper third of the ear.

### METHODS

A 68-year-old healthy female patient presented with a 1.5 cm lesion, infiltrated and adhered to the cartilaginous plan in the upper third of the left helix, which was diagnosed as a basal cell carcinoma (Figure 1). The exeresis of the lesion and corresponding cartilaginous structure was able to preserve only the posterior face of the auricular pavilion (Figure 2) – which lost its support completely. Due to the size of the defect, and with the goal of preserving the original curvature and creating support for the reconstruction, a decision was made to use the type of flexible silicone fiber that is used in orthopedic surgeries. (Oval tendon spacer, Medicone, Cachoeirinha – RS, Brazil) (Figure 3). After implanting the silicone fiber up to the edge of

## New techniques

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**Figure 1** - Before the procedure



**Figure 3** - Adaptation of the silicone fiber



**Figure 2** - Intra-operative period after the removal of the cartilage of the upper third of the ear



**Figure 4** - Preauricular transposition flap

the surgical defect, the area was covered again with a wide transposition flap originating from the preauricular region (Figures 4 and 5). The separation of the flap took place in a second surgery, four weeks later, when the wound opened and the implant became visible (Figures 6 and 7). An infection developed at the site of the dehiscence, which did not respond to topical or systemic antibiotic therapy. The proximal portion of the fiber extruded and was removed after eight weeks; the infection healed and the aesthetic results were satisfactory (Figure 8).

**DISCUSSION**

Defects in the auricular pavilion can be classified according to their location (upper, middle and lower third) and thickness: total (loss of the cartilage) or partial (only the skin).<sup>1</sup> A great number of reconstruction techniques have been described in the literature, with appropriate grafts or flaps for each area, which yield good aesthetic results.<sup>1,2</sup>

Small chondrocutaneous defects can be resolved with direct suture,<sup>1,3</sup> however large total thickness defects are difficult to repair due to a lack of cartilaginous support. When the pavil-



**Figure 5** - Before the second surgery and dehiscence with exposure of the implant

ion's contour is not affected, healing by second intention for small lesions or a simple graft for larger lesions ensure excellent reconstruction results.<sup>2</sup> In cases where the outer support is affected, complex techniques involving compound or cartilage grafts (costal, ipsi or contralateral auricular pavilion covered by



**Figure 6 -** Immediately after surgery



**Figure 7 -** Late post-operative period with infection



**Figure 8 -** Late post-operative period after removing the fiber, with the resolution of the infection

local flaps, are necessary. Compound grafts taken from the opposite ear are useful for defects of up to 1.5 cm. However, the risks of necrosis of the graft and sequela in the donor ear reduce their acceptance and applicability.<sup>1,2</sup> The costal cartilage was initially used for the reconstruction of congenital deformations of the

auricular pavilion,<sup>1</sup> supplying cartilage pieces that must be molded as required. The techniques for obtaining it demand experience on the part of the surgeon, and complications, such as chronic residual pain and pneumothorax, can occur.<sup>1,3</sup>

Auricular cartilage from the opposite ear is currently the most frequently used in reconstructions of acquired lesions of total thickness, for it allows a more delicate and flexible support, in addition to a more straightforward removal and a minor residual scar.<sup>1,2</sup>

In an attempt to avoid wide incisions in both ears, and based on recent reports in the literature,<sup>3</sup> a decision was made to use the thin and flexible silicone fiber that is used in tendon reconstructions in hand surgeries.<sup>4</sup> That material generates little inflammatory response and helped support and maintain the auricular pavilion's shape, making it possible to cover the whole defect and the fiber with a preauricular transposition flap, resulting in a very satisfactory aesthetic result.

The main risks associated with the use of synthetic materials are infection and the extrusion of the product<sup>1,2</sup> – which have historically discouraged their use.<sup>1</sup> In this case, these events occurred two months after the procedure, probably due to the dehiscence that occurred in the flap's suture. After that period, even with the removal of the implant, the fibrosis generated in the healing site of the flap on the posterior face of the ear was enough to maintain the support and shape of the auricular pavilion. This technique is a viable alternative to the use of cartilage or compound grafts in the auricular pavilion. ●

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