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Mastoid fascia kite flap for cryptotia correction

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ABSTRACT

Objective: Cryptotia is one of the most common malformations of the upper auricle with aesthetic and functional consequences, however there is no standard treatment. We present the surgical technique and results of a kite flap procedure which can be used in the different cryptotia subtypes.
Methods: We reviewed all patients treated in our department from 2010 to 2015, using a mastoid fascia kite flap technique. The incision of this local flap follows the retro-auricular sulcus along the rim of the helix superiorly and drawing a skin paddle inferiorly. The mastoid fascia is exposed and a superiorly and posteriorly based flap is drawn and detached from the skull. Finally, the skin paddle is rotated and sutured between the superior helix and temporal skin creating the superior sulcus. The retro-auricular incision is closed directly inferiorly.
Results: Six patients (mean age 12) and seven ears were studied. One patient had bilateral cryptotia and only two had a normal contralateral ear. Mean follow-up was of 45 months. There was no skin necrosis, no complications reported and no revision surgery.
Conclusions: We describe a reliable flap with a simple design and improved aesthetic result, as the thickness of the flap projects the helix well, the scar is entirely hidden in the retro-auricular sulcus and the direct suture induces a harmonious medialization of the inferior part of the ear and earlobe.

1. Introduction

Cryptotia is one of the most common congenital malformations of the upper auricle. The upper pole of the ear is buried under the temporal skin, with aesthetic and functional consequences due to the absence of sulcus (such as the difficulty to wear glasses). The most probable mechanism is an abnormal muscle insertion on the ear's cartilage [1–3] leading to subtype I (superior auricular and auricular transverse muscle anomalies) and subtype II (auricular oblique muscle anomalies). However, there is no standard treatment and many surgical methods have been developed [2,4–7]. These range from V–Y and Z plasties, rotation plasties to skin or cartilage grafts [3,6,8]. In our study, we present a new technique, the mastoid fascia kite flap, which does not leave any apparent scar and medializes the inferior part of the ear for a better aesthetic result.

2. Methods

We reviewed all patients treated for cryptotia in our department from 2010 to 2015. All patients were operated on by the senior author (FD) using the mastoid fascia kite flap technique. The initial follow-up was studied for early complications and patients were contacted for any late complications.

The surgical technique is described in Figs. 1 and 2. An incision is made along the rim of the superior helix in the future position of the sulcus (A to B). The skin incision is followed downwards into the existing retro-auricular sulcus where an ellipsoid skin paddle is drawn, (B to A′) with BA′ length slightly superior to that of AB. Less than half of the skin paddle should be harvested from the auricular cartilage to prevent skin necrosis.

A sub-skin dissection is made posteriorly exposing the mastoid fascia which contains the vascular elements to the skin paddle. A rectangular shaped mastoid fascia flap is drawn at an angle of approximately 45° posteriorly and superiorly to the skin paddle (B to D and A′ to C). The total thickness of the fascia is then lifted from the skull leaving it attached posteriorly and superiorly, without having to isolate any vascular pedicle. The skin paddle is rotated

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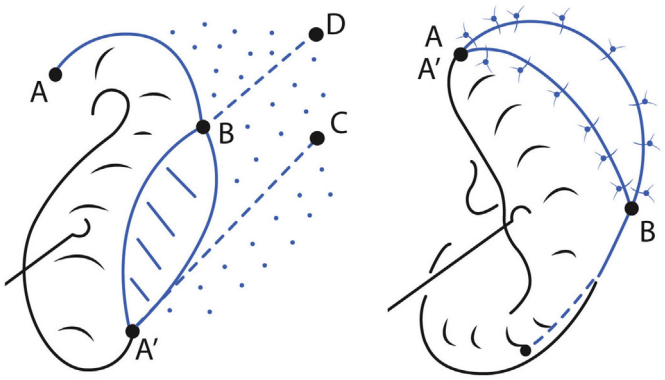

Fig. 1. Drawing of the mastoid fascia kite flap in a left ear, in both drawings the ear is folded back with a skin hook. Left: Initial drawing of the flap, incision from A to A'. The skin palate is in between point B and A′ in the post-auricular sulcus. The dotted area behind the ear represents the extent of the sub-skin dissection. Point C and D represent the posterior attachment of the rectangular mastoid fascia flap. Right: Final step of the reconstruction. The skin paddle has been rotated, enabling point A′ to be elevated and sutured to point A, thus creating the superior sulcus.

anteriorly and superiorly so that point A′ is sutured to point A, recreating a sulcus. If needed, a stitch can reposition the cavum conchae using non-absorbable braided thread. The inferior retro-auricular incision is closed directly.

With this technique two objectives can be achieved. Firstly, the creation of a superior retro-auricular sulcus and secondly the medialization of the inferior half of the ear and of the earlobe. (see Fig. 3).

3. Results

Six patients and seven ears were treated for cryptotia in our department, with a total of seven ears (bilateral in one case). Mean age at the time of the surgery was 12. Patient characteristics are recorded in Table 1. Out of the seven ears, five (71%) were type I and two (29%) were type II. Out of the six patients, five (83%) were male and one (17%) had bilateral cryptotia and associated middle ear malformation. Only two (33%) had a normal contralateral ear and none were diagnosed with a genetic anomaly, although two (33%) had other associated malformations. Immediate surgical follow-up was satisfactory with no flap necrosis or infection. Mean long-term follow-up was of 45 months (range 6–72). The long term satisfaction of all patients was excellent, with a good response on the aesthetic and functional aspect (possibility to wear glasses) and corresponded to the operator's own satisfaction with the reconstruction. No long term complications were notified (including reinvagination or hypertrophic scar) and none of the patients demanded revision surgery.

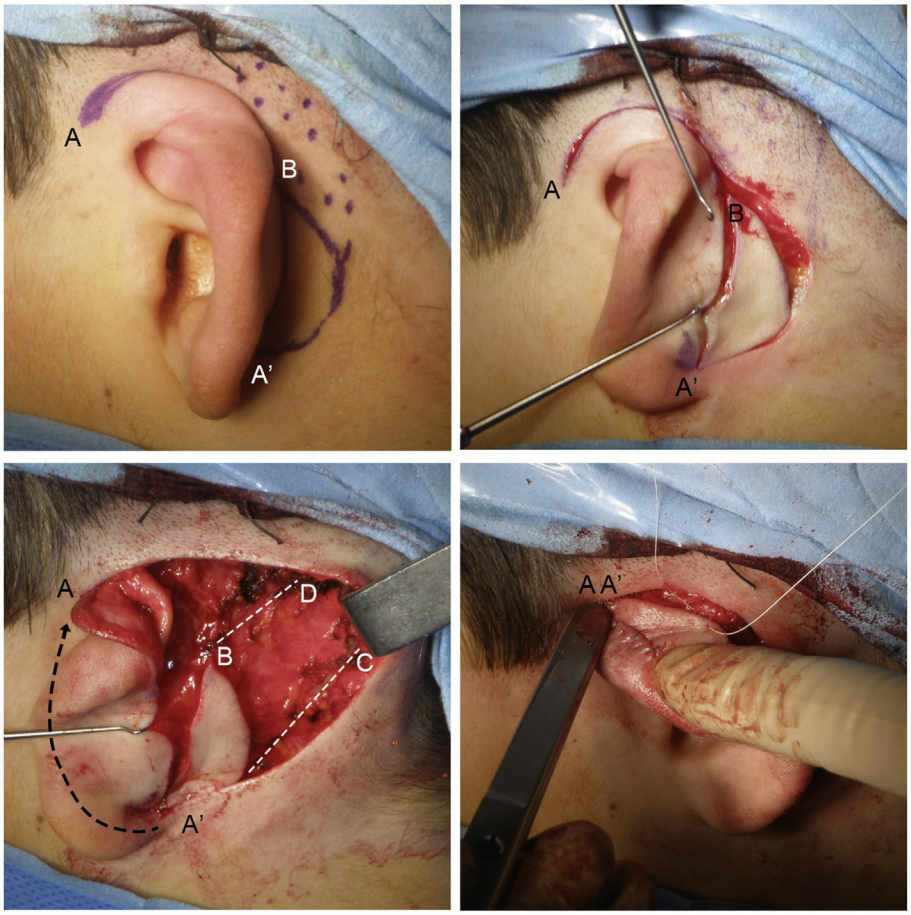

Fig. 2. Per-operative photos of the mastoid fascia kite flap (patient 2, type I cryptotia). Upper left: incision of the skin from point A to A′, with skin paddle from point B to A'. Dots represent the sub-skin dissection. Upper right: After skin incision. Lower left: Sub-skin dissection exposing the mastoid fascia with the vascular elements to the skin paddle. The dissection must be far back enough so as not to twist the vascular elements when rotating the flap. The mastoid fascia flap is shown with dotted white lines and corresponds to a posteriorly attached rectangle from point B to D and A′ to C. A dotted black arrow shows the rotation of the flap anteriorly and superiorly. Lower right: The lower extremity of the skin paddle (point A′) has been brought to point A, creating the sulcus. The incision is closed directly.