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[Ideas and Innovations]

Modified Antia-Buch Repair for Full-Thickness Upper Pole Auricular Defects

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Full-thickness upper pole auricular defects may result from congenital deficiency, trauma, or tumor excision. Various techniques have been used for reconstruction of these defects; many are complex or staged procedures and are inappropriate in the older population suffering from skin tumors. The "wedge excision"[1,2] allows tumor extirpation and repair in a single stage. However, this results in pointed auricular shape and protrusion when applied to the upper pole. The Antia-Buch [3] repair, incorporating a large posterior chondrocutaneous flap and an anterior helical flap mobilized on a preauricular skin pedicle, addresses these deficiencies. However, we have found extensive dissection necessary for a tension-free closure, and the earlobe is often distorted.

We apply the concept of crescentic scaphal excision [4] and the original Antia-Buch [3] rotation-advancement principle to treat upper pole auricular lesions in a single stage.

Technique

The lesion is excised with adequate margins, which determines the resultant height of the reconstructed ear (Fig. 1, *above, left* and *center*). The defect in the scaphal hollow, being part of the full-thickness excision, is converted to a crescent by removing chondrocutaneous "horns" on each side of the defect, preserving posterior perichondrium and skin (Fig. 1, *above, right*). When the technique is applied to lesions in the anterior helix, a chondrocutaneous crescent in the scaphal hollow is formally excised (Fig. 2, *left*). The upper incision, made through the skin and cartilage, is placed under the eave of the remaining helix, whereas the lower incision extends along a smooth curve to the tip of the horns (Fig. 1, *above, center*). The resultant posterior chondrocutaneous flap, with the attached skin and perichondrium, is advanced anteriorly without extending the incision to the lobule

and without the need for extensive subperichondral dissection, as in the original Antia-Buch repair. The blood supply for this flap is from branches of the posterior auricular artery.5 The anterior chondrocutaneous flap is raised outlining the helical root-anterior helix complex. Vascularity of this flap is maintained through a narrow skin pedicle antero-superiorly, incorporating the upper auricular branch of the superficial temporal vessels and a small contribution from branches of the posterior auricular vessels (Fig. 1, *above, right*).5 A limited subperichondral dissection deep to the triangular fossa allows easy advancement posteriorly. Occasionally, it is necessary to divide the perichondrium to allow adequate mobilization, but care is taken not to injure the upper auricular vessels, which are situated in the supra-perichondral position. The anterior and posterior chondrocutaneous flaps are then advanced along the curve of the crescentic scaphal excision and sutured in layers without tension. The helical root secondary defect is closed in a V-Y fashion (Fig. 1, *below, left*).

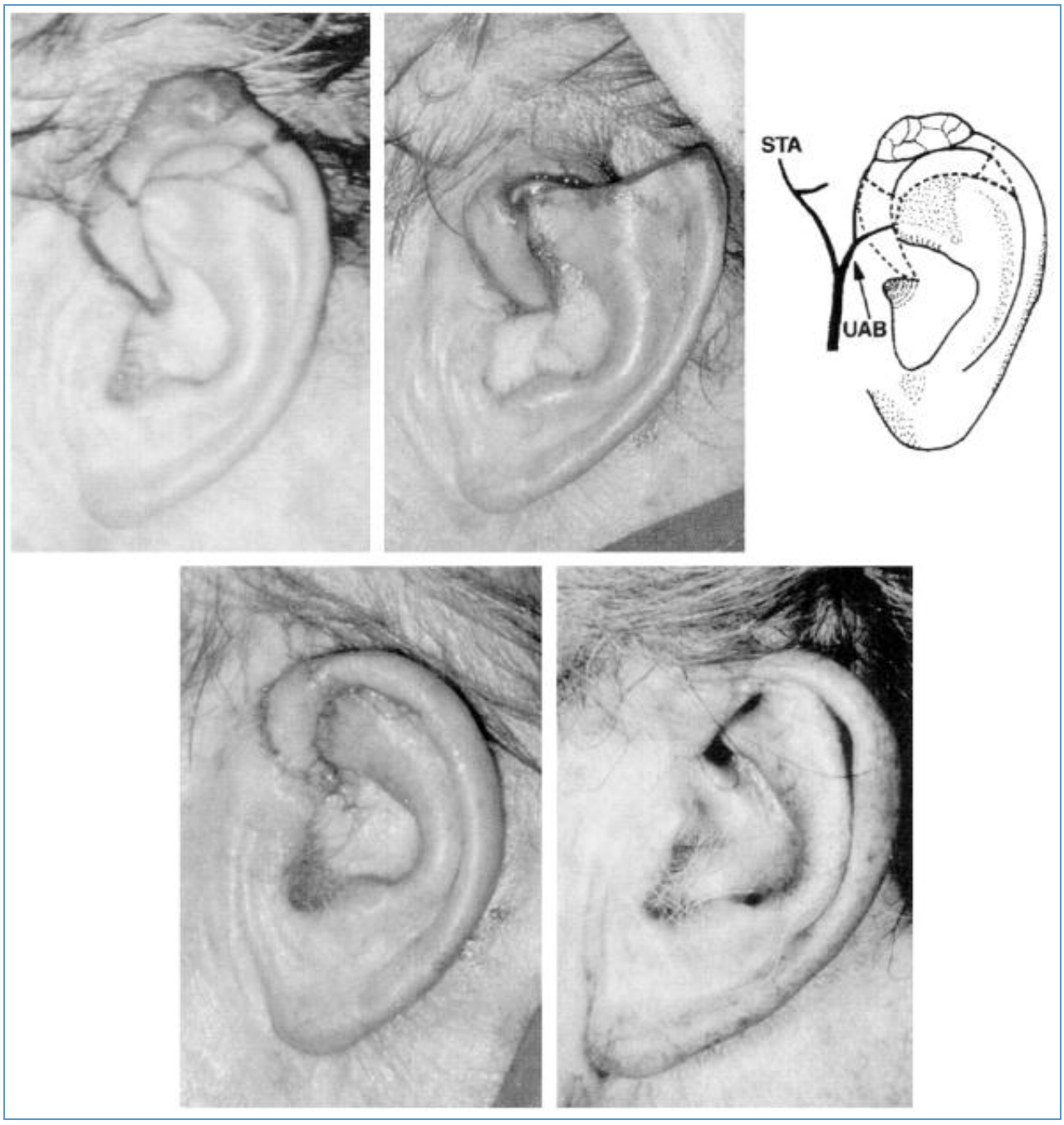

Fig. 1. (*Above, left* and *center*) A squamous cell carcinoma on the superior helix. Excision with adequate margins determines the resultant height of the reconstructed ear. (*Above, right*) The defect in the scaphal hollow, being part of the full-thickness excision, is converted to a crescent by removing chondrocutaneous "horns" on each side of the defect, preserving posterior perichondrium and skin. (STA, superficial temporal artery; UAB, upper auricular branch). (*Below, left*) The anterior and posterior chondrocutaneous flaps are then advanced along the curve of the

crescentic scaphal excision and sutured in layers. The helical root secondary defect is closed in a V-Y fashion. (*Below, right*) Satisfactory results are shown here at 7 months.

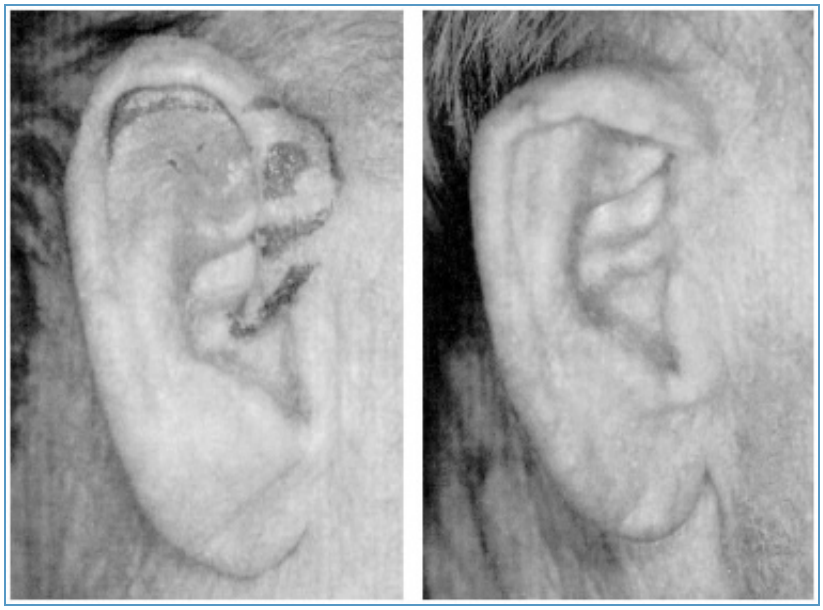

Fig. 2. (*Left*) Repair following excision of a squamous cell carcinoma on the anterior helix involved removal of a chondrocutaneous crescent in the scaphal hollow. (*Right*) Result at 6 months.

Results

Eight consecutive patients with a variety of upper pole auricular lesions were treated with full-thickness excision and immediate reconstruction using our modified Antia-Buch technique, carried out by the senior author (S.T.T.) (Table I). Surgery was performed under local anesthesia as an office procedure. In this study, the width of the resultant defect was expressed as a percentage of the upper pole helical length. The upper pole was defined as the upper half of the ear above a horizontal line drawn across the root of the helix. There were no complications, including flap necrosis. A natural auricular shape without alteration of the projection of the ear was achieved in all cases (Figs. 1 through 3).

Patient	Age (years)	Pathology*	Site	Side	Defect† (%)	Follow-Up (months)
R.V.	78	SCC	Anterior helix	R	21	4
A.P.	67	BCC	Superior helix	R	20	7
J.B.	74	SCC	Superior helix	L	21	4
G.P.	79	CDNH	Anterior/superior helix	L	17	6
H.F.	74	SCC	Superior/posterior helix	L	25	8
G.T.	64	SCC	Superior helix	L	33	7
J.W.	75	MM	Anterior helix	R	35	5
A.M.	63	CDNH	Superior helix	L	20	2

* Abbreviations: SCC, squamous cell carcinoma; BCC, basal cell carcinoma; CDNH, chondrodermatitis nodularis helicis (recurrent following three previous excisions); MM, malignant melanoma.
† Percentage of the upper pole helical length.

TABLE I Demographic Data of Eight Consecutive Patients

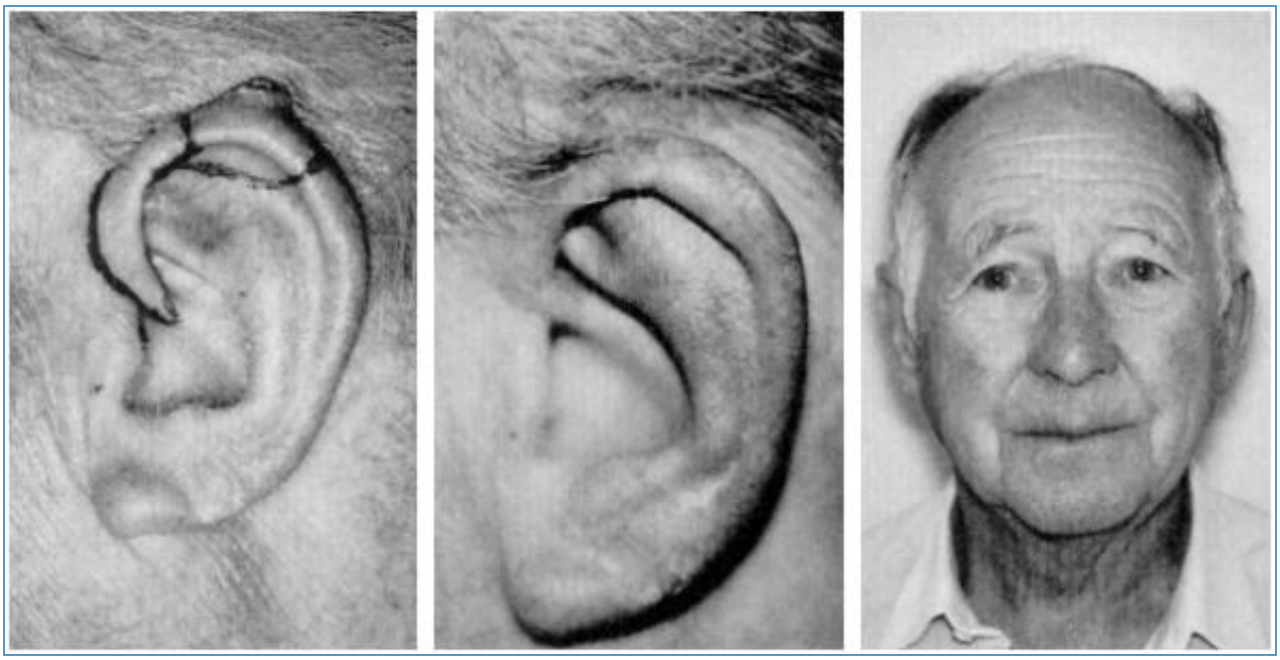

Fig. 3. (*Left*) A squamous cell carcinoma on the superior helix of the left ear was excised and repaired. (*Center* and *right*) Results at 6 months with no alteration in projection of the reconstructed ear.

Case Reports

Case 1

Patient G.T., a 64-year-old man with a squamous cell carcinoma on the superior helix of his left ear (Fig. 1, *above, left*), underwent full-thickness excision resulting in the loss of 33 percent of the helix of the upper pole (Fig. 1, *above, center*). The defect was repaired with the modified Antia-Buch technique (Fig. 1, *above, right* and *below, left*) with satisfactory result at 7 months (Fig. 1, *below, right*).

Case 2

Patient R.V., a 78-year-old man with a squamous cell carcinoma on the anterior helix of his right ear, was treated with excision and repair using the modified Antia-Buch technique. This involved formal excision of a chondrocutaneous crescent in the scaphal hollow (Fig. 2, *left*). Result at 6 months is shown in Figure 2 (*right*).

Case 3

Patient J.B., a 74-year-old man, presented with a squamous cell carcinoma on the superior helix of his left ear (Fig. 3, *left*). The lesion was excised, resulting in the loss of 21 percent of the helix of the upper pole, which was repaired with the modified Antia-Buch technique. Results at 6 months with no alteration in projection of the reconstructed ear are shown in Figure 3 (*center* and *right*).

Discussion

Techniques used for repair of full-thickness upper pole auricular defects include composite auricular grafts,[2]

chondrocutaneous advancement flaps,[6] postauricular flaps with or without cartilage grafts,[3,7] mastoid tubed pedicle flaps,[8] and tissue expansion with cartilage grafts.[9] Many of these techniques are complex, multi-staged procedures, often requiring general anesthesia, and may be unsuitable for the older population. Our modified Antia-Buch technique allows excision and repair in a single stage under local anesthesia as an office procedure. It is suitable for repair of defects up to a third of the upper pole helical length. Its application to wider defects or defects primarily located in the scaphal hollow may result in an unacceptable loss of auricular height, which is determined by tumor clearance. However, the removal of the horns in the scaphal hollow narrows the width of the ear, resulting in a more proportionate and natural auricular shape. Although reduction of the opposite normal ear using a previously described technique [4] will correct the height discrepancy, all of the eight patients have declined further surgery.

In contrast to the original Antia-Buch method, our modified repair requires less extensive dissection and results in less conspicuous scars with minimal disruption of anatomic landmarks and alteration of auricular projection. The technique is safe, as it is based on a reliable blood supply, which has been well described previously.[5] It can also be used for repair of full-thickness defects in the upper pole of the ear resulting from trauma, although we have not done this yet.

Summary

Various reconstructive techniques have been described for repair of full-thickness upper pole auricular defects. The wedge excision commonly used for treatment of upper pole tumors allows excision and reconstruction in a single stage. However, this technique suffers from major deficiencies. We apply the concept of crescentic scaphal excision and the Antia-Buch advancement-rotation flap principle to repair various full-thickness upper pole auricular defects resulting from excision of skin lesions in eight consecutive patients. The technique achieves a natural auricular shape in three dimensions with minimal disruption of the anatomic landmarks and avoids conspicuous scars. It has several advantages over the original Antia-Buch repair and other techniques used for reconstruction of full-thickness upper pole auricular defects.

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IMAGE GALLERY

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Fig. 1

Fig. 2

TABLE I Demographic ...

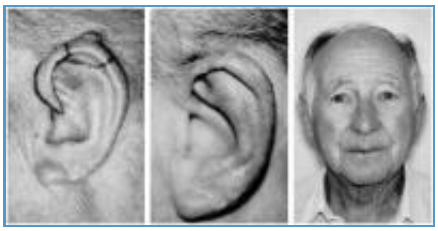

Fig. 3

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