

RECONSTRUCTIVE CONUNDRUM

Right angled triple sliding –island flap

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A 90 year old patient under anticoagulation treatment, was hospitalized to the “METAXA” Cancer Hospital in Piraeus having three modules in the side neck area, in a triangle shape fashion about 3X4 cm. The patient, upon physical examination had no palpable lymph nodes.

The final defect after skin cancer removal was a triangle 3X4X5 cm.

How would you- reconstruct this defect?

Resolution

The analysis revealed the involvement of an area with extended movement (neck).

As in other patient's repair in the same area, big rotation flaps present difficulties in minimizing movement, specially during relaxation.

In the case of a patient under anticoagulations treatment, movement in big flaps may result in hemoragie. Using graft in the defect also problems with hematomas, and necroses in that area.

Skin elasticity was not appropriate for big advancement flaps.

Also rhombic flap did not have enough extra skin and hence tension could be maximized resulting in bad blood supply.

An idea the modification and the extension of a Celsus flap (25BD-50AD) with semilunar relief incisions in the base of the flap. (Marmelzat)¹.

Also, modification has been made by Jones² in 1847, with the Y to V closure for skin cancer treatment.

In 1918 Esser has published the island flap, and in 1920 Cillis has introduced the V to Y advancement flap.

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Similar flap described in 2003 by Beham³, named "keystone".

Procedure

Once we have designed the right angled triangle and three squares, one for each side (as in the proof of Pythagoric Theorem in Geomettry) (picture 1), incisions were made in all lines, which means there is no skin base for the 3 flaps.



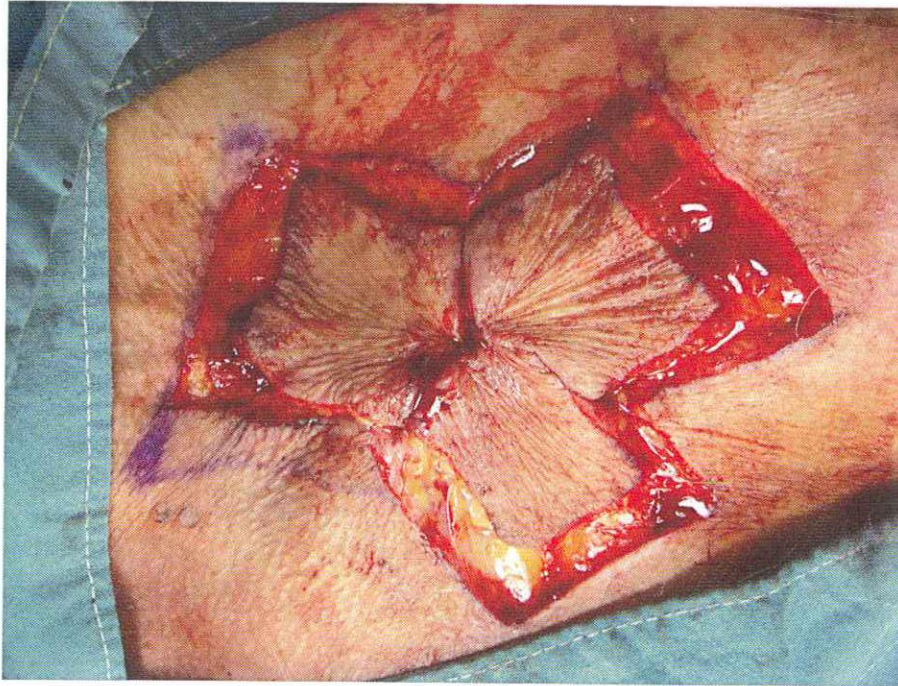
1) Skin cancer removed in right angle triangle fashion , and 3 square flaps designed

This would be the first reported case, in which three square sliding flaps close big defect in side neck area.

In the periphery we have made extended undermining of the skin, and the three flaps, sutured to the surrounding skin, between

The blood supply is coming through the small arteries from dermis. First we have prepared the dermis stem, with little undermining in depth of about 1cm. The three flaps were pulled to the center of the defect, where they were sutured between them, and in the base with absorbable sutures. In the periphery, we have made extended undermining of the skin, and the three flaps, sutured to the surround skin, between them and to fascia, with absorbable sutures. The secondary defects between flaps and

periphery are about 1-2cm (picture 2).



Three square island flaps sutured between them and undersurface, with absorbable sutures (2)

The flaps must not be pulled with maximum tension, because this affects the blood supply, making the small arteries narrow. The blood supply is coming from the area under the flap, through a stem like mushroom, from the base to the surface.

We check the blood supply after suturing, using the Allen test waiting for 1 hour, to see pink and not white color of the flaps (gold hour). Allen in his article (1929) in Amer. J. Med Science writes: «Doctor presses the skin waiting for the pink color to come again».

Local anesthetic was injected, Xylocaine-Adrenaline 1%, for better blood circulation in the three big square flaps, with side 3-5cm each.

The flaps were sutured between them, to the 9 side polygonic finale defect and to the under area (fascia).

According to Galen (130-200 AD) the straight line incisions and the multi-level suturing, gives better results. Meticulous hemostasis must be done to avoid hematoma. Final suturing of the skin follows with nylon 3-0 (picture 3).



The 3 flaps sutured in 9-side polygonal skin secondary defect, with non absorbable sutures

Blue color appears in some areas, in 2 of 3 flaps, probably because of bad vein circulation. Two incisions were made, on the flaps, to avoid suture removals, and blood came out after pressure, protecting flaps from necrosis. After 2 hours the color was pink.

Antibiotics were given locally and systematically and after 24 hour the flaps were pink.

The blood supply to the platysma muscle and the skin over that, is coming from external carotid artery, that gives arterial branches from down to up as follows.

Arteries: upper thyroid and occipital, lingual and back auricular, facial, internal mandibular, superficial temporal.

Hunter wrote (1794) in "Treatise on the blood, inflammation and gunshot" (Edinburg), and Quain- Wilson (18420 in "Series of anatomical plates in lithography" (London) about the subdural arteries and their anastomoses. They stated that anastomoses are denser, where the vessels were more far. Septal-dermal arteries described also by Grand (1958) in the Anatomy book, and Cormak-Lambery (1984).

Two centuries after Hunter's work, Taylor and Palmer⁴ describe the "vascular territories" and "angiosomes" (from the Greek word angio = vessel and soma=body, as written in the footnote of article).

Manhot (1889) in "De Hantarterien" (Leipsig) and Salmon (1936) in "Arteries de la peau" (Paris), described the main

There are two kinds of perforating arteries of the skin. a) Straight from the main vessel between muscles septum, giving blood supply and to muscle as well, b) smaller, as final branches only from muscles.

Both networks are connected between them and from all these vessels blood comes to the flaps.

Three weeks later, after all suture were removed, the flap, had regular pink color (picture 4). A small infection next to the center was healed using antiseptics and



(4)

Final result after total suture removal, 3 weeks later

antibiotics, locally.

Coleman⁵ JJ (1982) has written on perforating vessel of the platysma muscle.

Conundrum keys

- 1) Right angled triple sliding-island flap, for side neck defect reconstruction, is a good option in hemorrhagic patients.
- 2) This flap gives flexibility and is more comfortable for patient's daily life, and also sleeping.
- 3) The combination of 3 sliding square flaps, has advantage for better blood supply, without strangulating the small vessels.
- 4) All sutures (absorbable and not) are placed with minimal tension.

References

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