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## CLINICAL CASE

# Reconstruction of cubital fossa skin necrosis with radial collateral artery perforator-based propeller flap (RCAP)

*Lambeau perforant en hélice basé sur l'artère collatérale radiale pour la couverture du pli du coude*

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### KEYWORDS

Propeller flap;  
Radial collateral artery  
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Cubital fossa;  
Elbow

**Summary** In recent years, perforator flaps have become an indispensable tool for the reconstruction process. Most recently, “propeller” perforator flaps allow each perforator vessels to become a flap donor site. Once the perforator of interest is identified by acoustic Doppler, the cutaneous or fascio-cutaneous island is designed and then customized according to the principle of “perforasome”. So, the flap can be rotated such a propeller, up to 180°. Ideally the donor site is self-closing, otherwise it can be grafted at the same time. Through a skin necrosis secondary to a contrast medium extravasation of the cubital fossa in a 47-year-old man, we describe the use of propeller perforator flap based on a perforator of the radial collateral artery (RCAP). The perforator was identified preoperatively by acoustic Doppler then the flap was adapted bespoke to cover the loss of substance. Ultimately, the result was very satisfying. Well experienced for lower-extremity reconstruction, perforator-based propeller flap are still few reported for upper limb. It is likely that in the future, propeller flap supersede in many indication not only free flaps and locoregional flaps but also, leaving no room for uncertainties of the vascular network, the classic random flaps.

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**MOTS CLÉS**

Lambeau en hélice ;  
Perforante de l'artère  
collatérale radiale ;  
Pli du coude

**Résumé** Les lambeaux perforants sont devenus ces dernières années un outil indispensable dans les processus de reconstruction. Les lambeaux perforants dits en « hélice », plus récents, permettent à chaque pédicule perforant sous-cutané de devenir un site donneur de lambeau. Une fois la perforante « d'intérêt » repérée au Doppler, la palette cutanée ou fasciocutanée est dessinée puis levée sur mesure selon le principe du « perforasome ». Elle peut ensuite être tournée telle une hélice jusqu'à 180°. L'idéal est que le site donneur soit autofermant, sinon il peut être greffé lors du même temps. Au travers d'une nécrose secondaire à une extravasation de produit de contraste iodé au niveau du pli coude chez un patient de 47 ans, nous décrivons l'utilisation du lambeau perforant en hélice basé sur une perforante de l'artère collatérale radiale (RCAP). La perforante a été repérée en préopératoire par un Doppler acoustique puis le lambeau a été modélisé en fonction de la perte de substance à couvrir. En définitive, le résultat a été très satisfaisant. Bien documenté pour la couverture des membres inférieurs, les lambeaux perforants en hélice restent peu décrits au membre supérieur. Il est fort probable que dans l'avenir, les lambeaux perforants en hélice supplantent dans beaucoup d'indications, non seulement les lambeaux libres et les lambeaux pédiculés locorégionaux mais également, en ne laissant plus de place aux aléas de la vascularisation, les classiques lambeaux au hasard.

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**Introduction**

Originally described in 1991 by Hyakusoku [1], a propeller flap can be defined as a cutaneous or fascio-cutaneous island based on perforator vessels. This flap can be rotated up to 180°, around an axis corresponding to the perforator vessels. Donor site is self-closing, or it can be grafted at the same time. An important literature exists for lower extremity reconstruction, however this procedure remains few described for upper extremity[2–7]. We present a case of successful reconstruction of large soft-tissue defects of cubital fossa after extravasation of radiographic contrast medium by performing a radial collateral artery perforator-based propeller flap (RCAP).

**Case report**

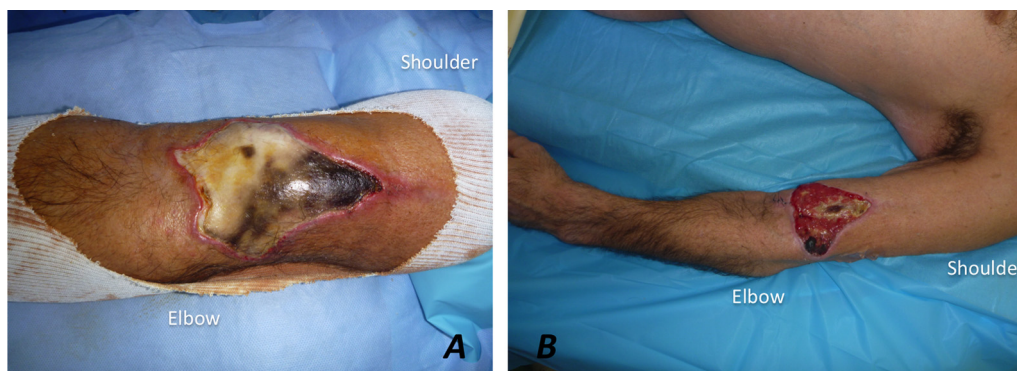
A 47-year-old man presented a large cubital fossa necrosis (8 × 7 cm) following a severe extravasation (100 cm<sup>3</sup>) of radiographic medium (Fig. 1A). After debridement and realization of 2 weeks of dressings (Fig. 1B), we decided to make a perforator flap. Acoustic Doppler examination performed by ourselves in the operating room has identified two perforators (Fig. 2A). It was the perforators of the posterior

radial collateral artery (RCAP) and the radial recurrent artery (RRA).

First, we performed an incision on the anterior edge of the flap, which was progressively dissected to identify perforator vessels (Fig. 2B). This procedure requires the wearing of microsurgery operating loupes.

Then, we set up a microsurgical clamp on the distal perforator, which was significantly of lower caliber, to confirm proper vascularization of the flap. Hence, the perforator was selected and then carefully dissected through the intermuscular septum between the brachioradialis and triceps muscle, over a length of more than 1 cm until its birth on the posterior branch of the radial collateral artery, in anticipation of its rotation.

The flap was rotated 120° and modelled to cover the defect (Fig. 2C et 2D). The donor site was self-closing (Fig. 3A). Operative time was 85 minutes. The patient's elbow was immobilized at 90° during the first week to avoid traction on the perforator following an accidental elbow extension. In the first days, the flap remained somewhat edematous but we did not observe any partial necrosis or healing problems (Fig. 3A). At 3 months, the cosmetic result was very suitable (Fig. 3B). Currently, the patient is very satisfied with the outcome and does not retain any functional problems.



**Figure 1** A. Massive extravasation of contrast medium with skin necrosis of the cubital fossa. B. Aspect after debridement and 2 weeks of local care.

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