Lambeau Antero-latéral de Cuisse

ALTF

Ou de la lente et longue évolution des lambeaux cutanés

• Lambeau antero-latéral de cuisse (ALTF) =
  – première description 1984 (Song)
  – Popularisation mondiale 20 ans après

Lambeau antero-latéral de cuisse


Nombre de publications sur le lambeau antero-latéral de cuisse

Le ALTF est naît trop tôt

• Lambeau antero-latéral de cuisse (ALT) =
  – première description 1984 (Song)
  – Popularisation mondiale 20 ans après
• Les raisons de ce délai résulte de la lente diffusion du concept des lambeaux perforants résumée par :
  « une longue maturation et une lente digestion »

Design of a cutaneous flap

Superficial = random flaps

Nasolabial
Sushruta

The indian flap

The Tagliocozzi flap
Design of a cutaneous flap

• For 3000 years = superficial
  – random flap
  • 2/1 ratio
  • Arc of rotation
  • 4 basic drawings

Planning of a cutaneous flap

Superficial = random flaps
Deep = axial flaps

1972 - Mc Gregor = the concept

The era of musculo-cutaneous flaps

Design of a cutaneous flap

• 1972 = deep, following source vessel
  – Axial flap
  • 1972 Mc Gregor = the concept
  • The era of musculo-cutaneous flaps

Planning of a cutaneous flap

Superficial = random flaps
Deep = axial flaps
Superficial = perforator flaps

1972 - Mc Gregor = the concept
1980 - Taylor
1986 - Nakajima

Classification of vessels for the skin

Design of a cutaneous flap

• 1990 = superficial
  – According with the anatomy of vessels for the skin
    • The result of fundamental and clinical work on skin vascularisation
    • The era of perforator flaps
  – Result during this last century of :
    • fundamental anatomical work
    • Clinical evolution

ADVANCEMENT

TRANSLATION

TRANSPOSITION

ROTATION
What did we learn from all this work?

- Stratification of the skin vascularization in 5 plexus
What did we learn from all this work?

- Stratification of the skin vascularization in plexus
- 3D organization = Angiosome concept
  - 61 territories = based on 61 main source vessels
  - 442 perforators over 0.5 mm

Skin paddle design = survival of the entire flap

Survival of the entire skin paddle

Sub-cutaneous network

- Long running sub-cutaneous vessels (limbs)
Sub-cutaneous network
• Long running sub-cutaneous vessels (limbs)
• Sensitive nerves accompanied by pedicle = neuro-cutaneous flap

What did we learn from all this work?
• Stratification of the skin vascularization in plexus
• 3D organization = Angiosome concept
  – 61 territories = based on 61 main source vessels
  – 442 perforators over 0.5 mm
• Skin paddle design = survival of the entire flap
  – The subcutaneous network
  – The capture rule

The capture rule
• Interconnection of all angiosomes by:
  – Choke arteries
  – Oscillating veins

Choke arteries & oscillating veins

The capture rule
• Interconnection of all angiosomes by:
  – Choke arteries
  – Oscillating veins
• Responsible for the Capture phenomena:
  – Anatomic Cutaneous Arterial & Venous Territory
  – Hemodynamic Cutaneous Arterial & Venous Territory
  – Potential Cutaneous Arterial & Venous Territory

Vascular territories
Survival of the entire skin paddle
The sub-cutaneous network

Survival of the entire skin paddle
The capture rule

What did we learn from all this work?

- Stratification of plexus in the skin
- 3D organization = Angiosome concept
  - 61 territories = based on 61 main source vessels
  - 442 perforators over 0.5 mm
- Skin paddle design = survival of the entire flap
  - The subcutaneous network
  - The capture rule
  - The perforasome concept

Perforasome concept
Saint-Cyr PRS 124 2009

- 1 principle = each perforator is linked with adjacent through direct & indirect communication
- 2 principle = Flap design according with connecting vessels
  - Limbs = longitudinal
  - Trunk = perpendicular
- 3 principle = preferential filling within the same angiosome
Perforasome concept
Saint-Cyr PRS 124 2009

• 1 principle = each perforator is linked with adjacent through direct & indirect communication
• 2 principle = Flap design according with connecting vessels
  – Limbs = longitudinal
  – Trunk = perpendicular
• 3 principle = preferential filling within the same angiosome
• 4 principle =
  – direction of vascularization of a joint perforator is away from the joint
  – Intermediate perforator is multidirectional

What did we learn from all this work?

• Stratification of plexus in the skin
• 3D organization = Angiosome concept
  – 61 territories = based on 61 main source vessels
  – 442 perforators over 0.5 mm
• Skin paddle design = survival of the entire flap
  – The subcutaneous network
  – The capture rule
  – The perforasome concept
• Classification of vessels for the skin

Vessels for the skin

• 3 types of vessels vascularising the skin:
  1. Direct path to the skin
  2. Perforating vessels but dissectable
  3. Perforating vessels but undissectable

A- Direct cutaneous artery

Ex: groin flap vascularized by superficial circonflexe iliac pedicle

B- Direct septo-cutaneous

Forearm flap vascularized by radial pedicle
A - Direct cutaneous artery
B - Direct septo-cutaneous artery
C - Direct muscular artery for the skin

Undirect undissectable F - Musculo-cutaneous perforator artery

To conclude
The history of skin flaps can be summarized by

- A longue maturation needed to acquire the fundamental bases of blood circulation and skin vascular anatomy and an long digestion by the practitioner for their application in the medical practice of flap surgery
Pourquoi le lambeau antéro-latéral de cuisse est-il né trop tôt ?

1984 - Article de Song
Classification de Nakajima
1989 - Concept de lambeau perforant DIEP flap (Koshima)
1984-1994 - DIEP flap et reconstruction mammaire (Allen)
1993-1998 - Travaux de Kimata et Koshima

Lambeau antéro-latéral de cuisse:
Travaux fondamentaux sur son anatomie vasculaire

Les articles à retenir:
– Xu, Applied anatomy of the antero-lateral femoral flap. 1988
– Koshima, The anterolateral thigh flap: variations in its vascular pedicle. 1989
– Zhou, Clinical experience and surgical anatomy of 32 free anterolateral thigh flap transplantation. 1991
– Koshima, Free combined composite flaps using the lateral circumflex femoral system for repair of massive defects of the head and neck region: an introduction to chimeric flap principle. 1993
– Kimata, Variability of the free anterolateral thigh flap for reconstruction of head and neck defects. 1997
– Kimata, Anatomic variations and technical problems of the anterolateral thigh flap. A report of 76 cases. 1998

Les rectifications principales des approximations de Song:
– Variations de l’origine de la perforante septo-cutanée directe (type B):
  • Nait de la branche descendante de la LCFA 25%
  • Nait directement de la fémorale profonde 30%
  • N’existe pas 45%

– Variations du type de perforantes cutanées:
  • Septo-cutanée directe (type B) 14%
  • Musculaire (type C & D) et septo-cutanée indirecte (type E) 82%
**Lambeau antéro-latéral de cuisse**

**Notions anatomiques fondamentales**

**Intermuscular septum**

**Vastus lateralis**

**LCTA**

**Branche descendante**

**Rectus femoris**

**Technique chirurgicale**

**Variation dans la technique de fermeture cutanée**

**Naissance des perforantes cutanées:** principalement à la moitié de la cuisse
Lambeau antéro-latéral de cuisse

Classification

1. Zone donneuse: peau de la région antéro-latérale de la cuisse
2. Composition du lambeau: Fascio-cutané
   - Fascio-cutané : fin et plastique +/- dépend du patient et du sexe. Utilisé comme un lambeau ultra-fin
   - Taille de la palette cutanée: 20 x 12 pour une fermeture directe
   - Musculo-cutané avec le muscle vaste externe
   - Composite ou chimérique avec tissus du voisinage (rectus antérieur, TFL, crête iliaque)
3. Type de vascularisation: pédicule LCFA, branche descendante
   - Direct septo-cutanée (type B) ou perforante septo-cutanée (type E)
   - Direct cutanée d’une artère musculaire (type C) ou perforante d’une artère musculaire (type D)
4. Type de transfert:
   - Pédiculé en îlot vasculaire (longueur du pédicule de 10 à 20 cm) à flux antérograde (reconstruction abdominale) ou à flux rétrograde (reconstruction du genou)
   - Libre (reconstruction de la tête et cou, autres régions ayant de besoin d’une large palette cutanée)
5. Préparation préopératoire: aucune

Indications

• Couverture de pertes de substance cutanée:
  – Joue et larges pertes de substance cervico-faciale
  – Abdomen
  – Membres
• Reconstruction de la cavité buccale:
  – Reconstruction de la langue
• Reconstruction complexe tridimensionnelle de la tête et du cou comme lambeau composite

Exemples de cas cliniques

Sarcome radio-induit de la joue: exérèse transfixiante
Composite flap with rectus femoris

Métastase pariétale cancer du col de l'utérus

- F 45 ans
- PDS 7 x 14 cm abdomen
- Lambeau musculo-cutané de vaste externe
- Pédiculé
Adénocarcinome récidivant de la tempe

- F 63 ans
- PDS 8 x 13 cm fosse temporaire
- Comblement et couverture
• F 33 ans
• PDS abdominale 8 x 10 cm
• Lambeau sensible (nerf cutané fémoral latéral controlatéral)