




Free versus pedicled flap
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Meet the professor (?) parallel sessions



Dr M. Dom, MD, DD
° April, 25th 1969
Consultant dept. Otolaryngology-Head and Neck Surgery
University Hospital Antwerp, Edegem, Belgium
Staff member dept. Oral and Maxillofacial Surgery
Middelheim Hospital, Antwerp, Belgium

Free versus pedicled flap

- Department of Oral and Maxillofacial surgery
Middelheim Hospital, Antwerp,

Belgium 2005-2009



Professor Eric Fossion

Free versus pedicled flap

- RPAH fellowship H&N Surgery

Sydney, Australia 2004



Professor Chris O'Brien

Free versus pedicled flap

- **Reconstructive techniques**
 1. Primary closure
 2. Transplant
 21. Non vascularized: Graft (soft tissue, bone)
 22. Vascularized
 221. Pedicled flap: Random pattern (local flap)
Axial pattern (regional flap)
 222. Free flap (soft tissue and/or bone)

Free versus pedicled flap

- **Analysis**
- **Defect:**
 - Extent
 - Soft tissue and/or bone
 - Communication between oral cavity/neck
 - Surrounding tissues: Scar formation
 - Vascularisation
 - Vessels
- **Patient:**
 - Previous treatment
 - Prognosis
 - Medical condition
- **Flap selection:**
 - Soft tissue(s) and/or bone
 - Match with surrounding tissues
 - Pedicle size and length

Free versus pedicled flap

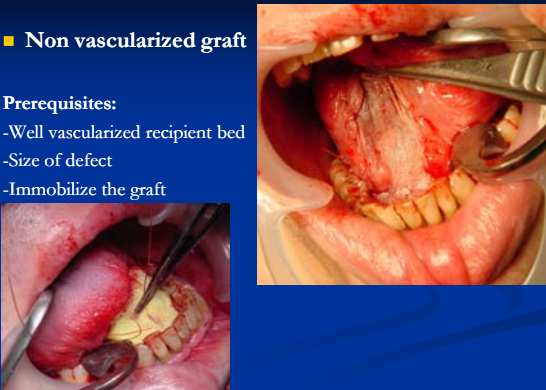
- **Primary closure**
 - Oral cavity-pharynx: Function
 - Facial skin: Aesthetics
 - Size (<1cm: secondary)
 - Location (Non Distortion)
 - Orientataion (RSTL)
 - Lip: Aesthetics and function

Free versus pedicled flap

- **Non vascularized graft**

Prerequisites:

- Well vascularized recipient bed
- Size of the defect
- Immobilize the graft



Free versus pedicled flap

- **Mandibular reconstruction:**
- **Why a segment resection?**
- **Non vascularized bone graft**
 - Need of well vascularized recipient bed
 - Size of the defect <5cm
 - Immobility of the graft(osteosynthesis or tray)
 - No exposure to oral cavity
- **Pedicled soft tissue flap and non vascularized bone graft**
 - Multistaged procedure (Marx)
 - Costs

Free versus pedicled flap

- **Mandibular reconstruction:**
- **Pedicled bone flaps**
 - Restriction in range vs traction
 - Limited bone stock(calvarium, rib, scapula, clavicle,...)
- **Free vascularized bone flaps**
 - Large defects can be bridged
 - Single staged procedure
 - Two-team approach

Free versus pedicled flap

<ul style="list-style-type: none"> ■ Pedicled flap Pectoralis major Deltpectoral Trapezius Platysma... Nasolabial Palatal island Biçhat Buccinator Temporalis Forehead Galea... Local skin/lip flaps 	<ul style="list-style-type: none"> ■ Free flap Radial forearm Latissimus dorsi/serratus Lateral arm Rectus abdominis Anterolateral Thigh DCIA Fibula Scapula ...
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Free versus pedicled flap

Predictors of complications in free flap surgery

Author	Country	Year
Shestak et al	USA	1992
Chick et al	USA	1992
Bridger et al	Australia	1994
Shaari et al	USA	1998
Singh et al	USA	1999
Pompei et al	Italy	1999
Serletti et al	England	2000
Eckardt et al	Germany	2003
Coskunferat et al	Taiwan	2005
Howard et al	USA	2005
Ozkan et al	Turkey	2005
Bonawitz	USA	2006
Classen et al	Canada	2006
Jones et al	USA	2007
Rosenberg et al	The Netherlands	2009

Free versus pedicled flap

- **Free Flap surgery and complications**

<ul style="list-style-type: none"> ■ Medical Pulmonary Cardiac Neurologic Renal Sepsis GI 	<ul style="list-style-type: none"> ■ Surgical ■ Recipient site Minor Major: Flap perfusion Haemorrhage Haematoma Wound healing/Fistula ■ Donor site
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Free versus pedicled flap

- **Predictors of complications:**
 Gender, Age
 Preoperative comorbidity status
 Etiology of defect, Site, Tumor stage
 Flap type
 Operating time
- Age alone is not associated with higher postoperative medical or surgical complications. It should not exclude the elderly patient from free flap surgery
- **Preoperative comorbidity** is a predictor for postoperative **medical complications**
- **Longer operation time** is a risk factor for postoperative **surgical problems**, not for medical

Free versus pedicled flap


- **Flap surgery and costs**

Author	Country	Year
Liu et al	Canada	2001
Funk et al	USA	2002
Jones et al	USA	2007
de Bree et al	The Netherlands	2007

- **Factors**
 Operating time
 Hospital stay(ICU/ward)
 Complication rate

Free versus pedicled flap

- **Costs of Free versus Pedicled flap: time is money**

Deltpectoral	One team	
	Two stage	
Pectoralis Major	One team	
	One stage	
Free Flap	Two team	
	One stage	

Free flap surgery is not more expensive than pedicled flap surgery

Free versus pedicled flap

- **Previous neck dissection and free flap surgery**
- **Exploring the neck**

Look for recipient vessels and check patency in first place

Previous neck dissection

- Selective ND : ipsilateral: Pirogoff 's triangle, external carotid
contralateral neck
- Comprehensive ND: contralateral neck

Alternative recipient vessels: transverse cervical, internal mammaia,
thoracoacromial, external jugular, anterior
jugular, cephalic vein,...

Free versus pedicled flap

- **Previous neck dissection and free flap surgery**
- **Selecting the free flap**

Long vascular pedicle free flap

- soft tissue: Radial forearm fasciocutaneous free flap
- bone : Fibula osteocutaneous free flap

Vein grafts: reliable?



Free versus pedicled flap

- **Flap surgery after radiotherapy.**

Indications

Radiotherapy induced bone necrosis
Radiotherapy/surgery induced cervical complications

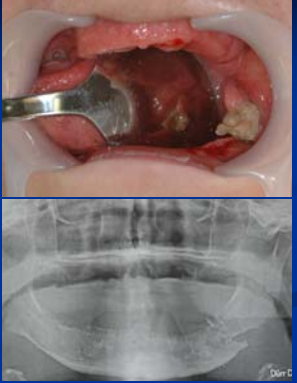
Salvage surgery after primary chemoradiation therapy
Salvage surgery after reirradiation

Free versus pedicled flap

- **Flap surgery after radiotherapy.**
 - Longstanding and recent comorbidities
 - Addressing the neck/Free flap choice
 - Soft tissue handling: recipient vessels
 - anastomosis
 - flap suturing
 - Wound complications
 - Flap survival versus patient survival

Free versus pedicled flap

- **Osteoradionecrosis**
- **Conservative management**
 - Hyperbaric oxygen
 - Pentoxifylline/tocopherol
 - Antibiotics
 - Analgesics
 - Debridement
- **Indication for surgery**
 - Pain
 - Fistula
 - Fracture



Free versus pedicled flap

- **Osteoradionecrosis**
 - Resection
 - Resection+
 - Soft tissue flap
 - Resection+
 - Reconstruction plate
 - Soft tissue flap
 - HBO+nonvascularized bone graft
 - Resection+
 - Free vascularized bone flap


Free versus pedicled flap

- Free bone flap-ORN

Mandible fracture

Neck vessels overlying skin


Patient status comorbidities malnutrition



The slide contains four intraoperative photographs. The top-left photo shows a mandible fracture with a metal plate and screws. The top-right photo shows a surgical site with exposed bone and soft tissue. The bottom-left photo shows a free bone flap being prepared, with a fork used to hold it. The bottom-right photo shows the free bone flap being inset into the surgical site.

Free versus pedicled flap

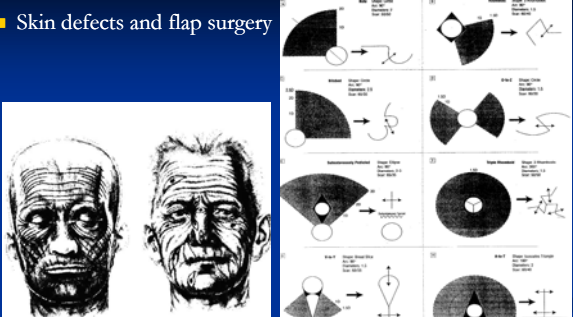
- Are the pedicled flaps outdated?



The slide contains two photographs. The left photo shows a patient's face with a pedicled flap being used for reconstruction. The right photo shows a patient's abdomen with a pedicled flap being used for reconstruction.

Free versus pedicled flap

- Skin defects and flap surgery



The slide contains two line drawings of a man's face, one showing a skin defect and the other showing the result of flap surgery. To the right is a grid of diagrams illustrating various skin flap techniques, including the forehead flap, cheek flap, and neck flap.

Fig. From: Arch Otolaryngol Head Neck Surg, 1998
Jan;124(1):60-6
Teaching Paradigm for Decision Making in Facial Skin
Defect Reconstructions
Collapses K.H. Gaskin, H. Chiu, P.R.







Free versus pedicled flap

- Skin defects and flap surgery



The top-left image shows a free flap harvest from the arm. The bottom-left image shows a pedicled flap harvest from the back. The right image shows a large, roughly circular skin defect on a patient's face, likely a cheek or forehead area.

Free versus pedicled flap

- Lip defects and flap surgery



The top-left image shows a lip defect with a flap being positioned. The bottom-left image shows a lip reconstruction with a flap. The top-right image shows a lip defect with a flap being positioned. The bottom-right image shows a lip reconstruction with a flap.

Free versus pedicled flap

- Lip defects and flap surgery

Bernard



The top-left image shows a lip defect with a flap being positioned. The bottom-left image shows a lip reconstruction with a flap. The top-right image shows a lip reconstruction with a flap. The bottom-right image shows a lip reconstruction with a flap.

Free versus pedicled flap

- Lip defects and flap surgery:

Abbe flap



Free versus pedicled flap

- Pectoralis Major Pedicled flap

Free flap failure

Cervical skin flap necrosis

Protect the neck from salivary contamination

Oropharyngocutaneous fistulas

Protection of great neck vessels/free flap pedicles

Empty neck

Reconstruction of the oropharynx

Free versus pedicled flap

Pectoralis Major flap and cervical complications



Free versus pedicled flap

- **Pectoralis major flap and oropharyngeal carcinoma**



Free versus pedicled flap

- **Donor site morbidity-Radial forearm free flap**

Range of motion/strength of wrist and fingers

Sensation

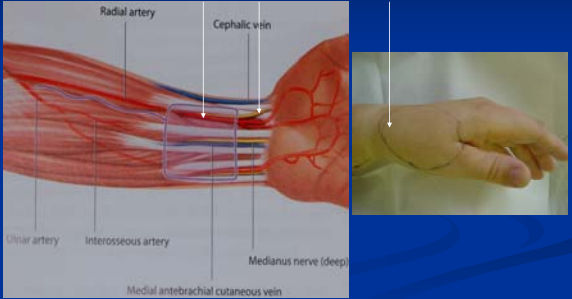
- Cold intolerance
- Scar/cosmesis
- Skin graft failure
- Fracture(osseofasciocutaneous)



Free versus pedicled flap

- **Donor site morbidity-Radial forearm free flap**

Dysesthesia: superficial branch of radial nerve



picture from:Raising of Microvascular Flaps-a systematic approach K.-D. Wolff&F.Holzle


Free versus pedicled flap

- Donor site morbidity: Radial forearm free flap



Free versus pedicled flap

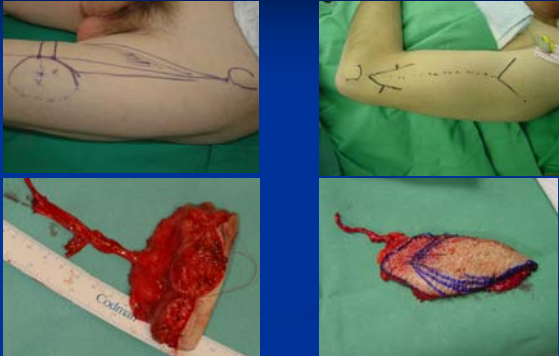
- Donor site morbidity
Anterolateral thigh as an alternative for the radial forearm flap?



Different indications

Free versus pedicled flap

- Anterolateral thigh versus Upper lateral arm



Free versus pedicled flap

- Donor site morbidity: DCIA flap
Deep Circumflex Iliac Artery flap

Hernia
Abdominal wall defect
Pelvic contour defects
Gait disturbance
Lateral thigh paresthesia

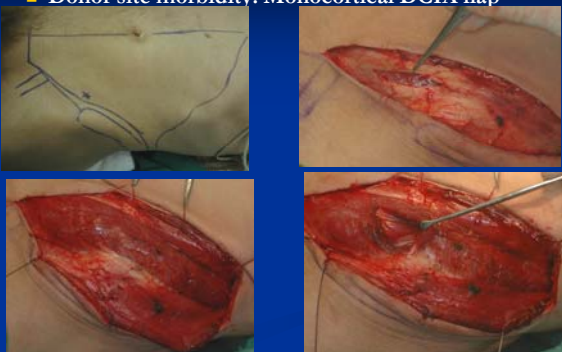
Free versus pedicled flap

- Donor site morbidity: DCIA flap
Deep Circumflex Iliac Artery flap

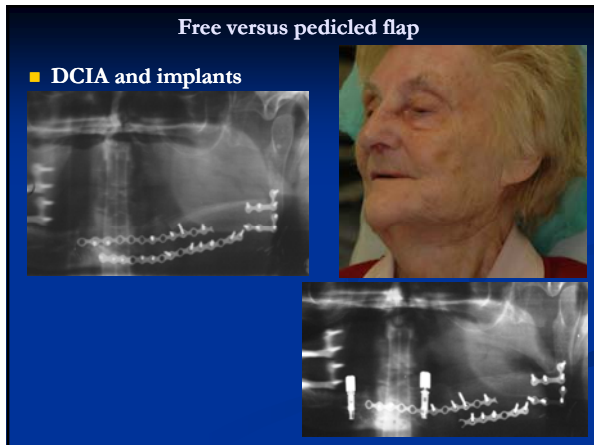
Different components:	Need for:
Skin	Skin?
Iliac bone	External cortex? Monocortical DCIA
Internal oblique muscle	External oblique muscle cuff?

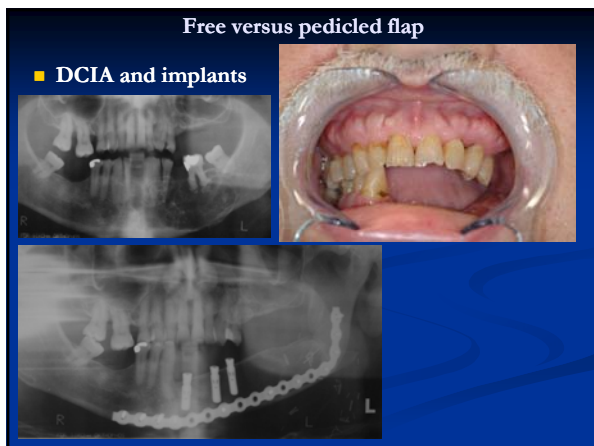
Free versus pedicled flap

- Donor site morbidity: Monocortical DCIA flap









Free versus pedicled flap

■ **Conclusions**

- Free **versus** pedicled flap?
- Free **or** pedicled flap?
- Free **and** pedicled flap!
