

THE RADIAL FOREARM SENSATE FREE FLAP: AN ADJUNCT FOR LARYNGEAL PRESERVATION IN ADVANCED POSTERIOR PHARYNGEAL WALL CANCER SURGERY

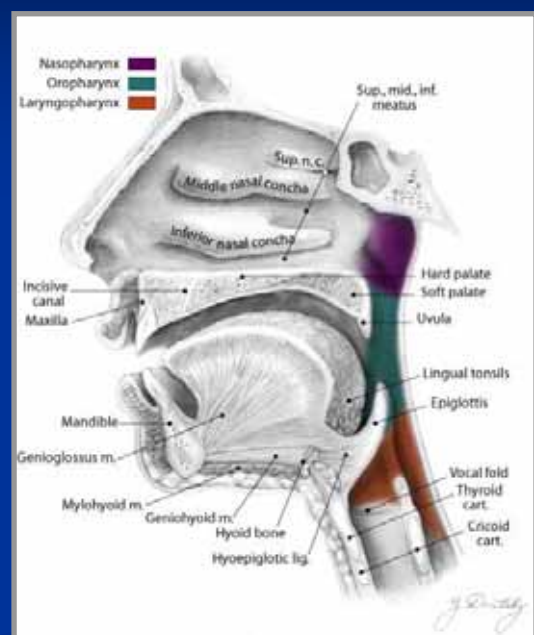
Emad A. Magdy, M.D.

Department of Otolaryngology – Head & Neck Surgery,
Alexandria University Medical School,
Alexandria, Egypt.



Surgical Anatomy:

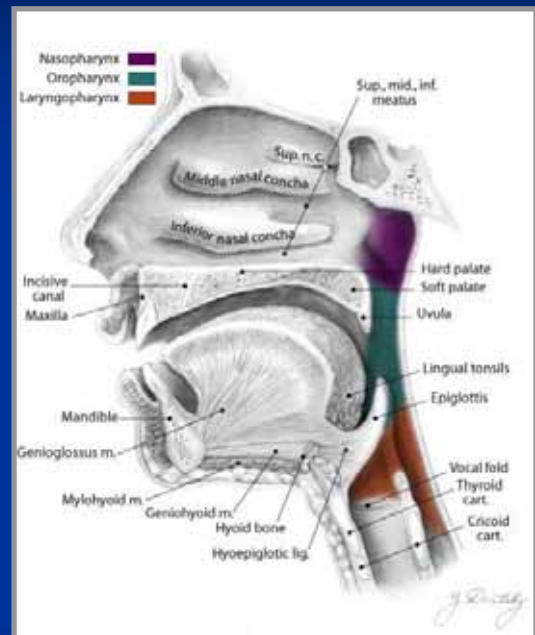
- **Posterior Oropharyngeal wall:** extending between levels of *junction of hard & soft palate* and *floor of vallecula*.
- **Posterior hypopharyngeal wall:** extending between levels of *floor of vallecula* and *lower border of cricoid*.



Emad A. Magdy, M.D. (2007)

Surgical Anatomy:

Tumors of these TWO subsites are described as ONE entity, because they have the same risk factors, lymphatic drainage, clinical behavior, prognosis and are normally treated the same.



Emad A. Magdy, M.D. (2007)

Posterior Pharyngeal Wall (PPW) Cancer:

- PPW cancers are uncommon (1.5 - 2.3% of upper aerodigestive tract carcinomas) – most are SCCs.
- Treatment options include:
 - Irradiation with surgical salvage.
 - Surgical resection followed by post-operative irradiation.
 - Combined treatment with chemotherapy & radiotherapy.

Emad A. Magdy, M.D. (2007)

PPW Conservative Cancer Surgery

TWO kinds of problems

ONCOLOGICAL

Resection has to be satisfactory to achieve local disease control

FUNCTIONAL

Reconstruction has to ensure good swallowing & avoid life-threatening aspiration

Emad A. Magdy, M.D. (2007)

PPW Conservative Cancer Surgery Reconstruction Options

- SMALL tumors limited to PPW:
 - Direct closure.
 - Mucosal suture to prevertebral fascia +/- STSG.
- LARGE tumors spreading to lateral HPW:
 - LOCAL FLAP: Platysma MCF.
 - REGIONAL FLAP: Pectoralis major MCF.
 - FREE FLAP: Radial forearm FF
Jejunal patch autograft.

Emad A. Magdy, M.D. (2007)

Current study:

- Included 11 patients operated in a four year period.
- All patients had a T₃ (UICC 1997) posterior pharyngeal wall SCC (> 4cm) in whom total laryngeal preservation was oncologically feasible.
- Only TWO patients had failed prior irradiation treatment.

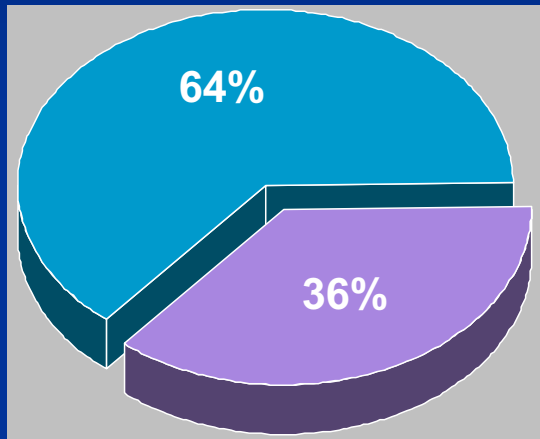
Emad A. Magdy, M.D. (2007)

Current study:

- Clinical stage of resected tumors:
 - T₃N₀ ($n = 7$).
 - T₃N₁ ($n = 3$).
 - T₃N_{2b} ($n = 1$).
- Mean size of mucosal defect: $42 \pm 13.1 \text{ cm}^2$
- All non-irradiated patients ($n = 9$) received PO radiotherapy \pm chemotherapy.

Emad A. Magdy, M.D. (2007)

Patients Age & Sex:



- Age range: 43-69 yrs.
Mean: 55.8 ± 7.4 yrs.

- Males : Females
7 : 4

Emad A. Magdy, M.D. (2007)

Criteria for PPW Conservative Cancer Surgery *

- Tumor at least 1 cm away from anterior angle of piriform sinus.
- Tumor at least 2 cm away from inferior border of cricoid (pharyngoesophageal junction).

* **Julieron M et al.** Surgical management of posterior pharyngeal wall carcinomas: functional and oncologic results. *Head Neck* 2001;23:80-6

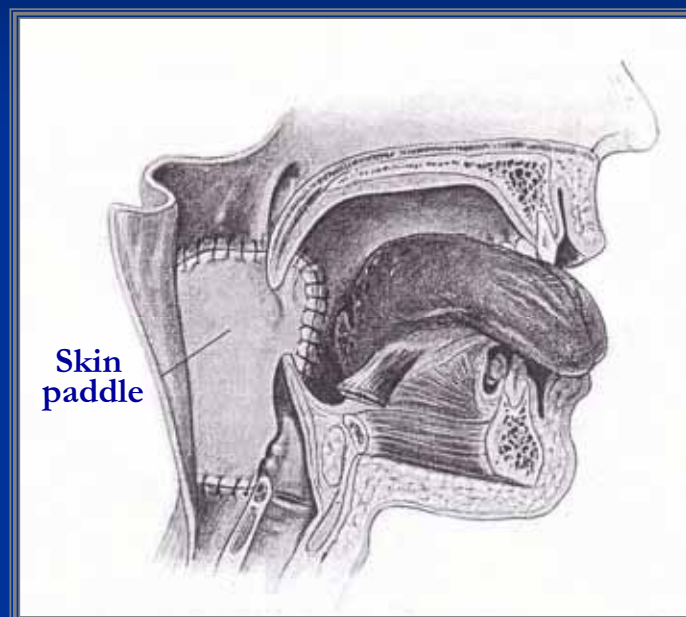
Emad A. Magdy, M.D. (2007)

Surgical approaches used for PPW tumor resection:

- Anterior midline labiomandibuloglossotomy approach (3 cases).
- Transcervical suprahyoid lateral pharyngotomy approach (8 cases).

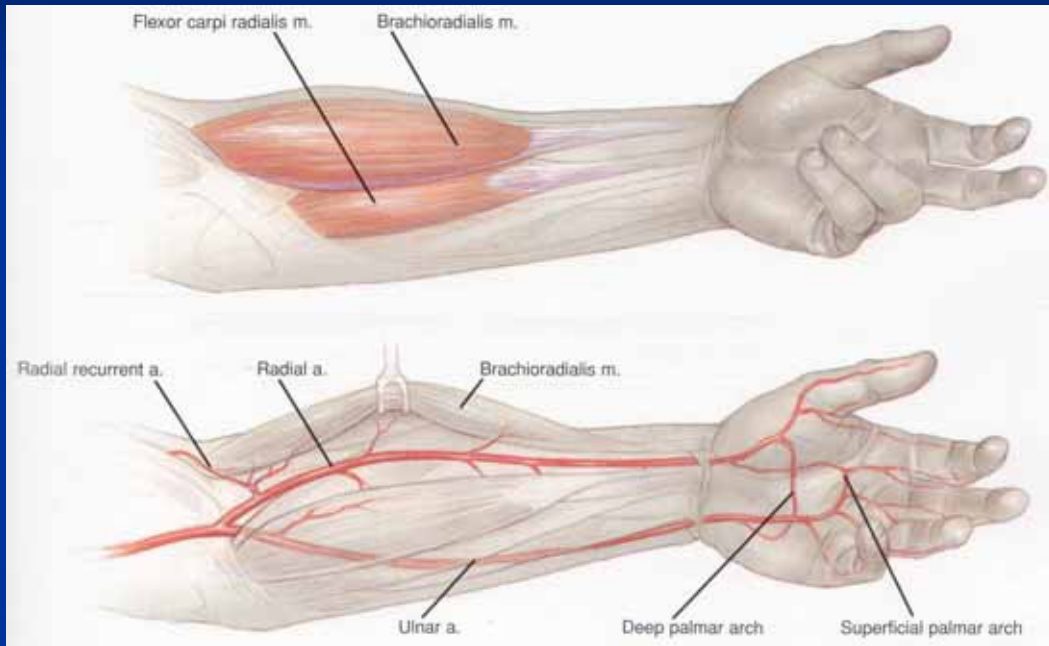
Emad A. Magdy, M.D. (2007)

RFFF for conservative PWW cancer surgery



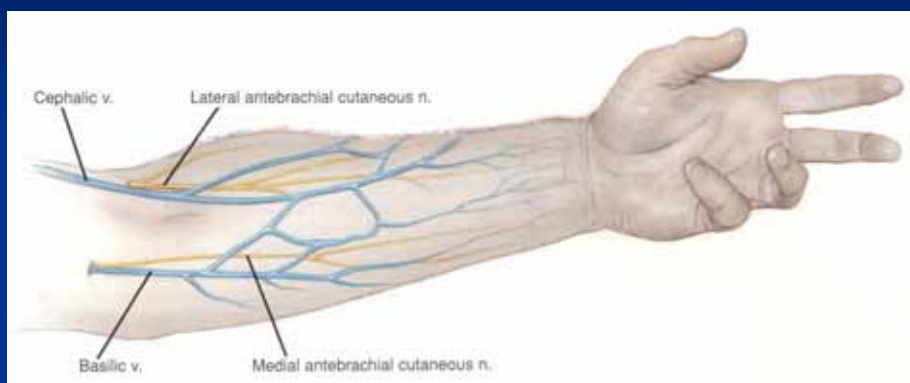
Emad A. Magdy, M.D. (2007)

Radial Forearm Free Flap



Emad A. Magdy, M.D. (2007)

RFFF Sensory Nerve Supply



Emad A. Magdy, M.D. (2007)

Microneural anastomosis:

- Between *lateral antebrachial cutaneous nerve* of the RFFF and a recipient head & neck sensory nerve was performed in all cases.
- Recipient Head & Neck nerves used:
 - Superior laryngeal nerve (8 cases).
 - Greater auricular nerve (3 cases).

Emad A. Magdy, M.D. (2007)

CASE PRESENTATIONS

Emad A. Magdy, M.D. (2007)

Case: 1



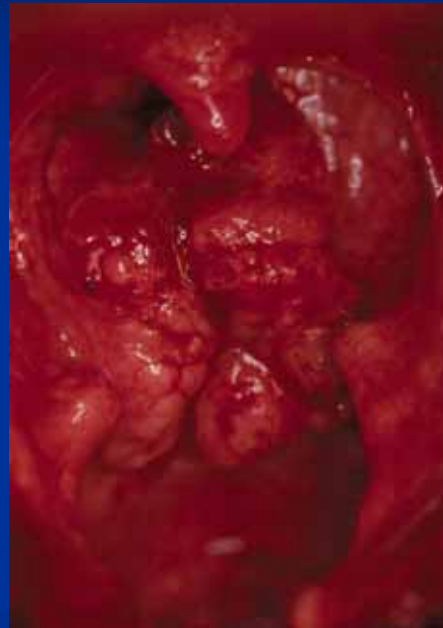
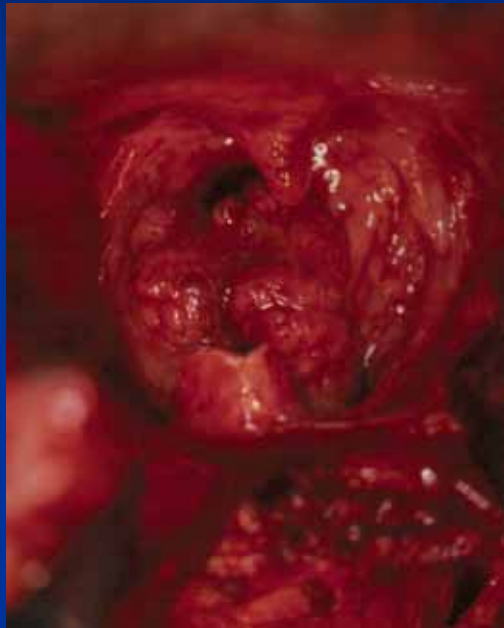
Emad A. Magdy, M.D. (2007)

Anterior Midline Labiomandibuloglossotomy approach:



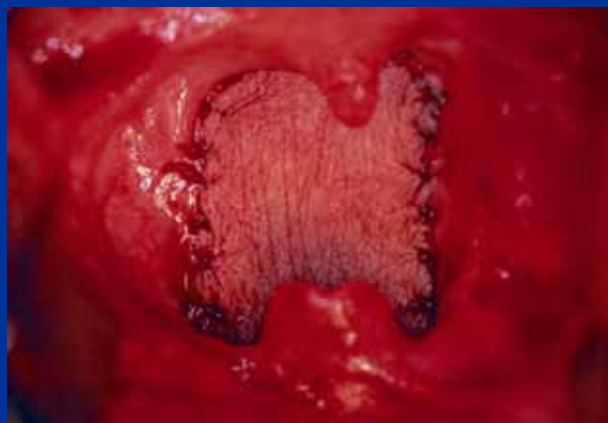
Emad A. Magdy, M.D. (2007)

PPW Tumor exposure:



Emad A. Magdy, M.D. (2007)

RFFF harvest & inset:



Emad A. Magdy, M.D. (2007)

Wound closure:



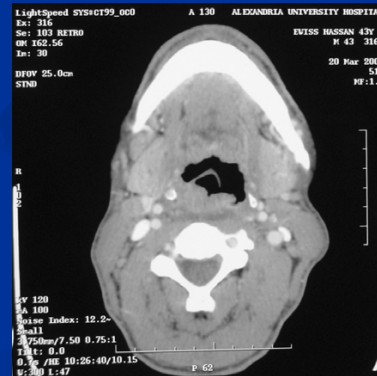
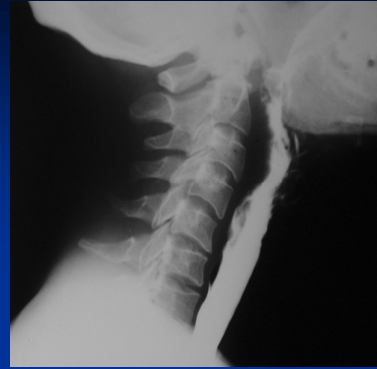
Emad A. Magdy, M.D. (2007)

Postoperative:



Emad A. Magdy, M.D. (2007)

CASE: 2



Emad A. Magdy, M.D. (2007)

Transcervical Suprahyoid Lateral Pharyngotomy approach:



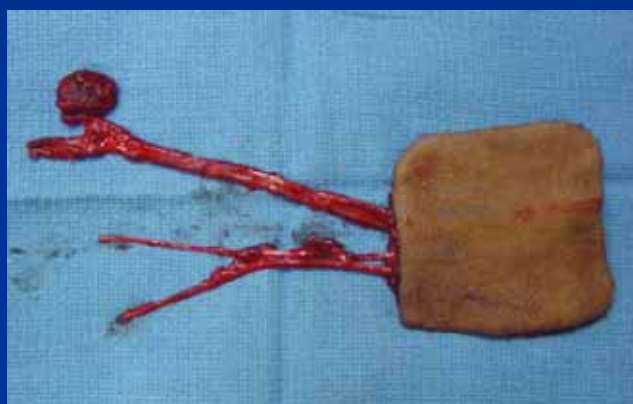
Emad A. Magdy, M.D. (2007)

RFFF design:



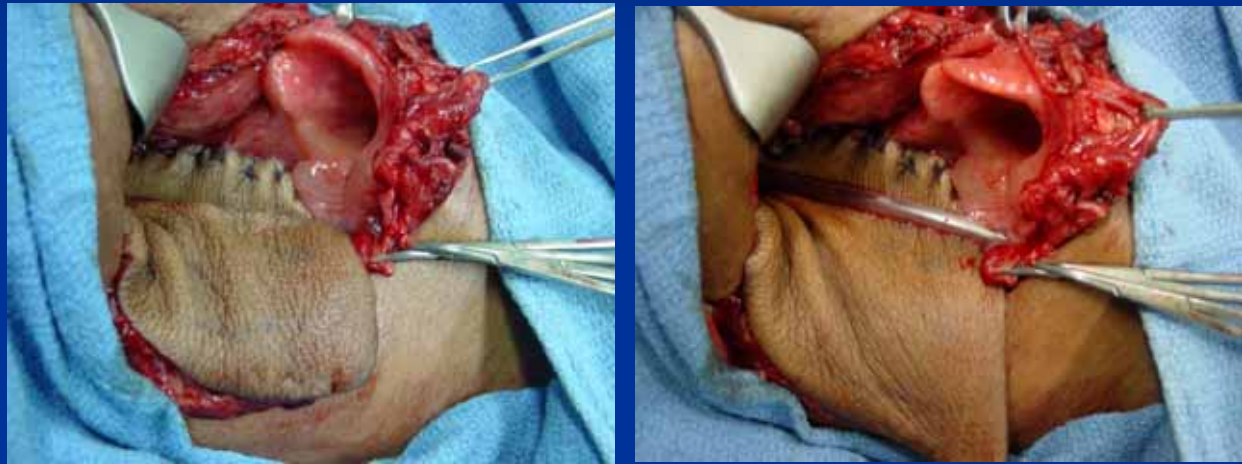
Emad A. Magdy, M.D. (2007)

RF sensate FF harvested:



Emad A. Magdy, M.D. (2007)

RFFF inset:



Emad A. Magdy, M.D. (2007)

Neck wound closed:



Emad A. Magdy, M.D. (2007)

Post-operative:



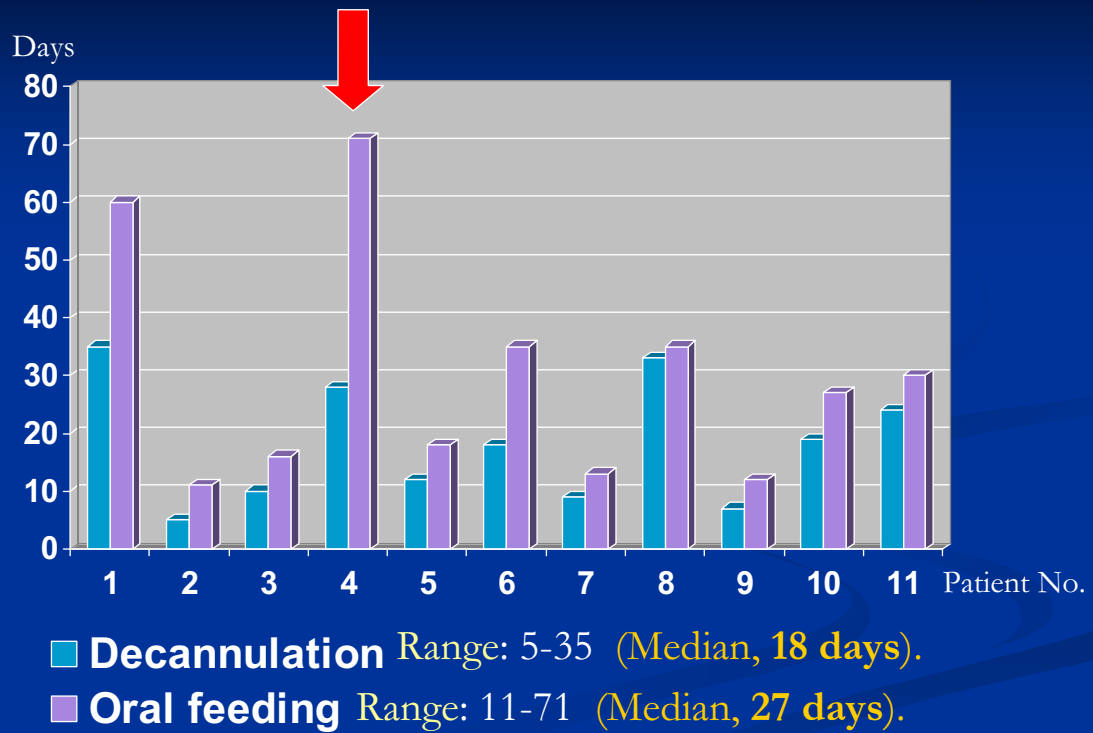
Emad A. Magdy, M.D. (2007)

Post-operative Complications:

- Only one free flap loss [**Case 4**] due to venous thrombosis “*Free flap survival rate 91%*”. (salvaged using: Pec. Major rotational MC flap).
- Small pharyngocutaneous fistula in two cases.
- Neck wound infection in one case.
- Partial donor-site STSG loss (< 25%) in one case.
- No peri-operative mortalities or aspiration pneumonias.

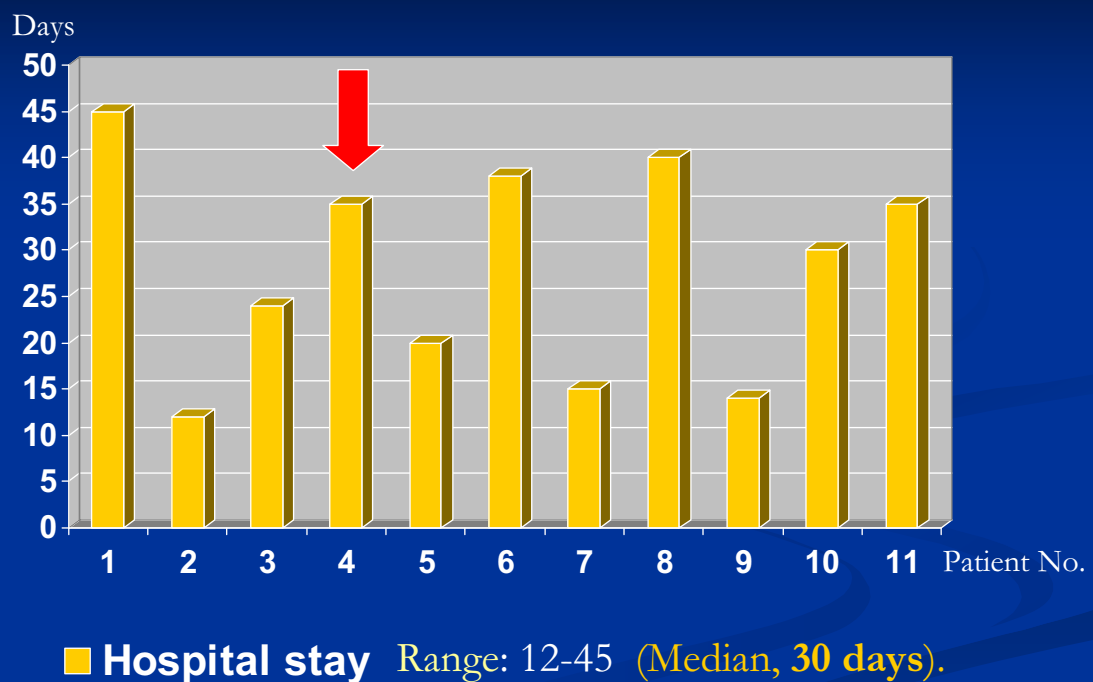
Emad A. Magdy, M.D. (2007)

Decannulation & Oral Feeding



Emad A. Magdy, M.D. (2007)

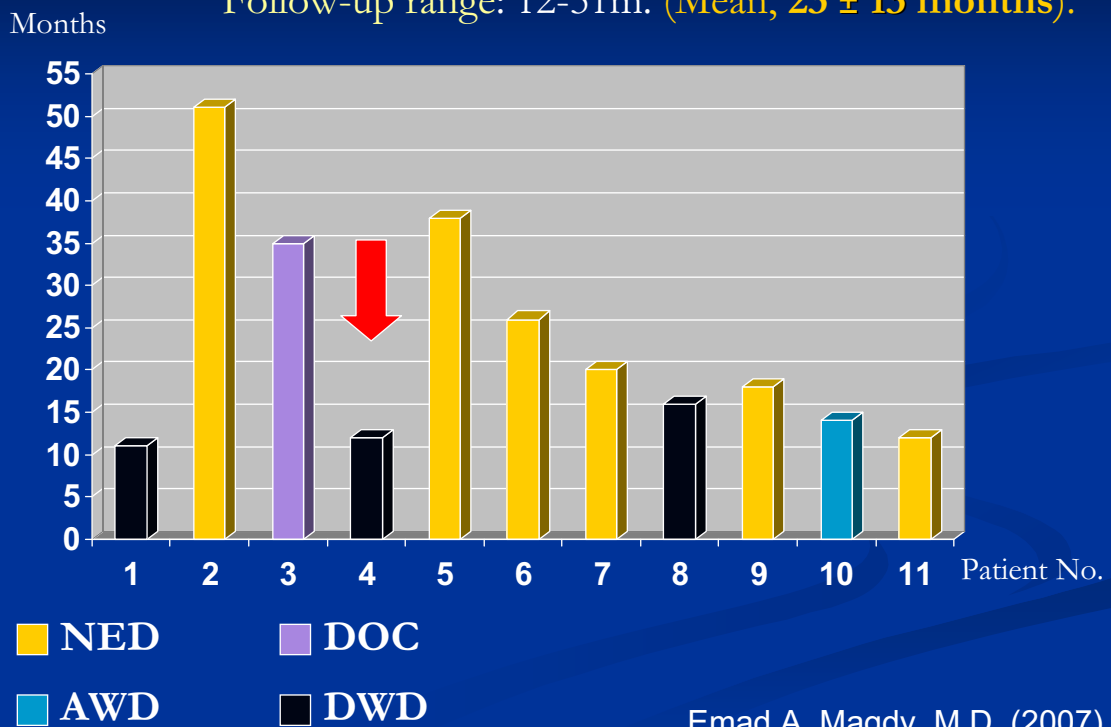
Hospital Stay



Emad A. Magdy, M.D. (2007)

Follow-up

Follow-up range: 12-51m. (Mean, 23 ± 13 months).



Functional outcome:

- All patients maintained their voice.
- Oral nutrition capabilities improved 6 & 12 months post-operatively as assessed by fluoroscopy.
- None of RFFF reconstructed patients required additional tube feedings.

Emad A. Magdy, M.D. (2007)

Concept of sensate free flaps:

- Sensory restoration to upper aerodigestive tract via sensate FFs first introduced by Urken *et al.* in 1990.
- Considerable controversy to what is responsible for recovery of sensation in transferred tissue:
 - Ingrowth of nerves from perimeter of defect.
 - Directed sensory restoration through neural anastomosis to recipient H&N sensory nerve.
- Inadequate model to test which of these phenomena is occurring.

Emad A. Magdy, M.D. (2007)

Concept of sensate free flaps:

- 3 patients who underwent primary laryngopharyngeal reconstruction with a sensate RFFF (anastomosed to the *superior laryngeal nerve*).
- Flap design included two separate skin paddles "one to resurface the laryngopharynx & other as an external monitor for buried flap".
- Several months afterwards, brushing external skin paddle precipitated a coughing fit proving concept of directed sensory restoration.

Urken ML. Advances in head and neck reconstruction. *Laryngoscope* 2003;113:1473-6

Emad A. Magdy, M.D. (2007)

Conclusions:

- Posterior pharyngectomy with larynx preservation is feasible in carefully selected patients with advanced PPW carcinomas without extension into the larynx.
- The unique properties of the RFFF, including its relatively thin, pliable nature and its excellent sensate potential makes it suitable for these defects enabling laryngeal preservation and thus offering patients a better quality of life.

Emad A. Magdy, M.D. (2007)

THANK YOU ..

