

# This Week's Citation Classic®

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**Bakamjian V Y.** A two-stage method for pharyngoesophageal reconstruction with a primary pectoral skin flap. *Plast. Reconstr. Surg.* 36:173-84, 1965.  
(Dept. Head and Neck B and Reconstructive Surgery, Roswell Park Mem. Inst., Buffalo, NY)

A new technique, with an unconventionally long and medially based flap from the upper anterior chest and shoulder, is used without any delay to minimize the difficulties entailed in reconstruction of the pharynx and cervical esophagus following their resection for cancer. [The SCI® indicates that this paper has been cited in over 280 publications. It is the most-cited paper published in this journal.]

Vahram Y. Bakamjian  
Department of Head  
and Neck Surgery  
Roswell Park Memorial Institute  
Buffalo, NY 14263

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The deltopectoral flap was developed, not through basic investigation in a laboratory setting, but through improvisation at surgery in Roswell Park Memorial Institute. One day, in 1959, I let our resident perform what I thought was to be simply a laryngectomy with neck dissection, but a larger cancer than had been estimated at endoscopy forced him to include the whole retrocricoid circumference of the pharynx. When I joined in to take over the reconstruction, it occurred to me that the rather short and low gap could be bridged by an acromially based pectoral flap (commonly used for cover on lateral neck defects) more advantageously than by the customary methods of a stent-supported inlay graft, a Wookey flap, or a delayed flap migrated from a distant site. Introduced obliquely, the flap was inverted to a hollow tube with anastomosis to the oropharyngeal stump above, while the transected esophagus was joined into the

seam of the skin tube near its lower end. The remaining outlet at the flap base was closed some four weeks later with division of the pedicle and rearrangement of the anastomosis to a straight line.

At the next similar occasion in 1962, the defect reached into the nasopharynx, well beyond the range of the relatively short acromially based flap. However, an unconventional medially based and longer deltopectoral flap could easily negotiate the distance by entering more vertically into the neck. Faced with the choice, it took only a moment of reflection to decide for it, taking into account the parasternal emergence of large perforator branches from the internal mammary artery and their lateral course in the pectoral skin. The plan worked without a hitch, and gradually thereafter I began to establish the extraordinary usefulness of this unorthodox flap, not only in pharyngoesophageal reconstruction but also in most other head and neck areas of major reconstruction, internal or external, between the brow and the clavicle.

When I submitted the paper to *Plastic and Reconstructive Surgery*, it was promptly returned with a query from the editor, wanting to know if I had any other than the three representative cases I had included, since it seemed to him dangerous and "foolhardy" to employ such a very long and medially based flap without preliminary delay of any kind. I responded with data from the rest of the first 9 or 10 cases I had done, and the paper was published in 1965. It has been cited frequently because it has come to be regarded as a milestone that provoked a fundamental rethinking of the vascular basis for flaps,<sup>1-5</sup> culminating in the distinction (made by McGregor and Morgan in 1973<sup>6</sup>) between flaps "axially" designed along known anatomical blood supply, in contrast to the "randomly" designed flaps of yore requiring multiple stages for tubing and safe migration to the area of reconstruction.

1. Bakamjian V Y, Cull N K & Bales H W. Versatility of the deltopectoral flap in reconstruction following head and neck surgery. (Sanvenero-Rosselli G & Boggio-Robutti G, eds.) *Transactions of the Fourth International Congress of Plastic and Reconstructive Surgery*. Rome, October 1967. Amsterdam: Excerpta Medica Foundation. 1969. p. 805-15.
2. Bakamjian V Y. Methods for pharyngoesophageal reconstruction. (Grabb W C & Smith J W, eds.) *Plastic surgery: a concise guide to clinical practice*. Boston: Little, Brown and Co., 1968. p. 359-70.
3. Bakamjian V Y & Rigg B. Experience with the medially based deltopectoral flap in reconstructive surgery of the head and neck. *Brit. J. Plast. Surg.* 24:174-82, 1971. (Cited 70 times.)
4. Bakamjian V Y & Pool M. Maxillofacial and palatal reconstructions with the deltopectoral flap. *Brit. J. Plast. Surg.* 30:17-37, 1977.
5. McGregor I A & Jackson I T. The groin flap. *Brit. J. Plast. Surg.* 25:3-16, 1972. (Cited 135 times.)
6. McGregor I A & Morgan R G. Axial and random pattern flaps. *Brit. J. Plast. Surg.* 26:202-13, 1973. (Cited 105 times.)