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Case Series

Single Staged Delto Pectoral Flap – A Case Series

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Conflict of interest: Nil

Abstract:

Introduction: DP flap is a fasciocutaneous flap with axial blood supply, a large size, which is thin and pliable, and is used for the reconstruction of the head and neck area. Its anatomy is reliable and can be elevated from the chest. . It is a work horse flap. . There are various modifications of this flap, like the island one. It is done by deepitialising the bridge and tunneling the flap beneath it, Covering two skin-lined surfaces.

Methods : It is a retrospective case study of 12 patients after taking proper consent for surgery and data for publication performed by our chief surgeon. Patients aged between 35 and 65 yrs. Out of which, 3 were females(25%) while 9 were male(75%). Eight patients were operated for coverage in reconstruction of head & neck cancer along with some other flaps. Three patients were used for coverage of neck vessels to prevent radiation. Single staged DP was used to, cover the stoma of tracheostomy. In three patients, the tubed DP was used to reconstruct the oesophageal conduit post Laryngopharyngeal excision defects. Single staged DP is used to cover the area above level V lymph node or the neck in the case of recurrence where the skin the neck was not good due to radiation. In four patients, it was used to cover the vascularized fibula flap as the surgery was for recurrence and PMMC was used in previous surgery and patients needed a flap to cover the outer defects.

Conclusion: DP flap still has an edge over other flaps pedicled/ free flaps due to its unique advantage of thinness, pliability, realible blood supply, low cost and donor morbidity. It plays an important role as a reconstructive option due to its versatile nature. It is an important flap for reconstruction in various complications in head and neck carcinoma cases as well. It is basically a two staged flap flap but we have modified it into a single staged surgery

Keywords: Deltopectoral flap (DP flap) , Pectoralis major myocutaneous flap (PMMC flap) , Free flaps.

Introduction

Delto pectoral flap was described in 1965 by Bakamjian for the reconstruction of a pharyngooesophageal junction[1]. It is used in reconstruction of head and neck cancers. It is a work horse flap. PMMC flaps is one of the maximally used flaps for oral cancer reconstruction. A DP flap is a fasciocutaneous flap with axial blood supply, a large size, which is thin and pliable, and is used for the reconstruction of the head and neck area. Its anatomy is reliable and can be elevated from the chest. With the help of delay, the length of a flap could be extended with the help of delay, which increases its usefulness. The donor site is grafted, which is cosmetically compromised, but functionally it is perfect. It is based on 2nd, 3rd and 4th perforators of the internal mammary artery. We can take the flap up to the deltopectoral groove, but the skin lateral to it is supplied by musculocutaneous perforators from the deltoid muscles, so beyond that it can only be taken as a random pattern flap and skin space is maintained as 1:1 ratio. Usually the pectoral fascia above pectoralis muscle is elevated along with the flap, at the same time deltopectoral fascia is included in random pattern part of the flap. It is usually used as a staged flap for reconstruction in the head and neck area, especially in oncos surgery. It could be used as a tubed oesophageal conduit in the case of carcinoma involving the larynx and pharynx. Sometimes, it is used as a single staged flap to cover the neck area, to protect at the time of radiation. In burns of the neck it could also be used for coverage over the neck.It could be elevated even when PMMC flap is elevated and used. There are various modifications of this flap, like the island

one, it is done by deepitialising the bridge and tunneling the flap beneath it, covering two skin-lined surfaces.

Aim: To study the single staged deltopectoral (DP) flap as a reconstructive option for defects in the head and neck region in the microvascular era.

Materials and Methods

It is a retrospective case study of 12 patients after taking proper consent for surgery and data for publication performed by our chief surgeon. Patients aged between 35 and 65 yrs. Out of which, 3 were females(25%) while 9 were male(75%).

Eight patients were operated for coverage in reconstruction of head & neck cancer along with some other flaps. Three patients were used for coverage of neck vessels to prevent radiation. In two patients, single staged DP was used to cover the stoma of tracheostomy.

In three patients, the tubed DP was used to reconstruct the oesophageal conduit post Laryngopharyngeal excision defects. Single staged DP is used to cover the area above level V lymph node or the neck in the case of recurrence where the skin the neck was not good due to radiation. In four patients, it was used to cover the vascularized fibula flap as the surgery was for recurrence and PMMC was used in previous surgery and patients needed a flap to cover the outer defects.

Table 1: Gender Bias

Male	9
Female	3
Total	12

Table 2: Single staged DP flap coverage of defects

Defects	NO.
Coverage of Vascularised Fibula	4
Closure of Tracheostomy	2
Coverage of neck vessels	3
Pharyngo oesophageal conduit	3
Total	12

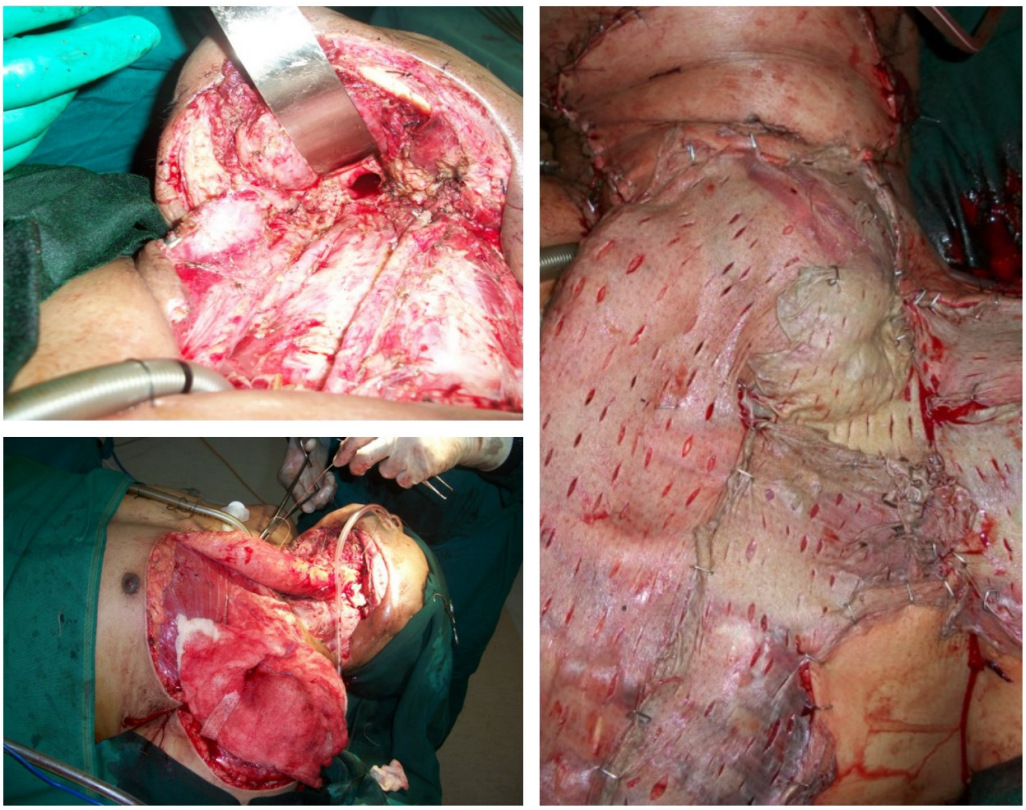

Fig 1: Single staged DP flap coverage for esophageal conduit as a thin tubed flap and donor area covered with split thickness skin grafting

Fig 2: Carcinoma right cheek defect covered using single staged DP flap

Fig 3: Carcinoma left cheek covered using single staged DP flap

Fig 4: Vascularised fibula covered using single staged DP flap

Results

12 patients were included over the last two decades study period with a range from 35 to 65 years. There were 9 males and 3 females. The median following time was 30 months. In eight patients, it was performed as primary surgery post oncological defect in which other flaps were used along with the DP flap. Three patients were used for coverage of neck vessels to prevent radiation. In two patients, single staged DP was used to cover the stoma of tracheostomy.

In three patients, the tubed DP was used to reconstruct the oesophageal conduit post Laryngopharyngeal excision defects. Single staged DP is used to cover the area above level V lymph node or the neck in the case of recurrence where the skin the neck was not good due to radiation. In four patients, it was used to cover the vascularized fibula flap as the surgery was for recurrence and PMMC was used in previous surgery and patients needed a flap to cover the outer defects. None of the flaps were delayed. The flaps healed well with minimal infections by antibiotics . There were partial loss of skin graft over donor area in two patients which was managed conservatively . Postoperatively oil massage and physiotherapy was advised . Patient with free fibula and DP flap gave good coverage while covering the neck vessels . In patient with esophageal conduit we have used to DP , PMMC as facility for microvascular surgery was not there in early part of this century . For patient underwent radiotherapy single staged DP flap gives good coverage foe exposed neck vessels . Dp flap gives a good coverage for tracheostoma.

Discussion:

The DP flap was described by Bakamjian for the reconstruction of the Pharyngeo oesophageal conduit after Laryngopharyngectomy in 1965. Later on it became the work horse flap for head and neck onco reconstruction. It lost its position only after the arrival of PMMC in 1978 and Microvascular surgery. But it is still used routinely for head and neck and other coverage over the neck area. With Various modification we have used it for coverage of neck skin in case of radiation, in the case of Tracheostomy closure. We have also used it as an island flap. It is also used for reconstruction of oesophageal conduits, even the islanded flap could be used. For oesophageal conduit. We have used it in four cases for coverage of outer defects in vascularized fibula, in cases where neck skin is not good due to radiation and there is recurrence and part of neck skin is excised out, then coverage of neck area is done with the help of a single stage Deltopectoral flap. The exposed vessels are covered with a flap and so it's useful when we have to get radiation.

, DP flap offers excellent advantages which are offered by very few flaps, like excellent color/ texture match, it is thin and pliable with minimal donor site morbidity. Lash first described the method of deepithelializing the skin bridge and tunneling the pedicle subcutaneously modifying it to an island flap, which makes a single stage insetting of the DP flap.[2] It was further modified by placing a single incision from the second intercostal space to the midpoint of the skin paddle. Superior and inferior skin flaps were then developed in the subdermal plane, preserving the vascular pedicle underneath. The flap dissection then proceeded from lateral to medial direction in the subfascial plane [3, 4]. It is safe and reliable as reported by Geden with a 100% flap survival rate [3]. . Bakamjian described a two-staged L-shaped DP flap: a short limb of the "L" extending down the proximal upper arm was raised and folded under the deltoid skin as a buried skin flap in the initial stage. After the delay, the DP flap, now with two epithelial surfaces, was then raised and transferred to the defect [5]. Krizek and Robson described splitting longitudinally of the DP flap to provide coverage of the two epithelial surfaces [6].

With advanced microsurgical techniques, it is possible to harvest the DP flap as an internal mammary artery perforator (IMAP) flap [7, 8]. With a hand-held Doppler preoperatively, perforators were located. They are then dissected through the intercostal muscles. Costal cartilages are often removed to enhance exposure. This technique can be applied to the harvest of both pedicled and free IMAP flap.

Donor sites are closed using skin grafting in most cases. DP flap is also indicated for management of complications,, release of neck contractures, closure of salivary fistulas or skin necrosis from radiation therapy. It is contraindicated when an internal mammary artery has been compromised from previous surgery.

Conclusion:

The DP flap still has an edge over other flaps, pedicled/ free flaps due to its unique advantage of thinness, pliability, reliable blood supply, low cost and donor morbidity. It plays an important role as a reconstructive option due to its versatile nature. It is an important flap for reconstruction in various complications in head and neck carcinoma cases as well. Single staged DP flap has an advantage of converting two staged surgery to a single stage preserving all the advantages of routine DP flap. Thus it's one more addition to the armamentarium for plastic surgeons .

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