



# Modification of Rotation-Advancement Split Pectoralis Major (RASP) Turnover Flap Technique for Median Sternotomy Wound Dehiscence

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Pectoralis major muscle flap was used alone or mostly combined with rectus muscle or omentum to cover the whole sternal defect.<sup>1–3</sup> Disadvantages are additional abdominal incisions, herniation of bowel, introducing infection to abdominal cavity. D. A. Staffenberg introduced “Rotation-Advancement Split Pectoralis (RASP) major muscle turnover flap” technique for median sternotomy wound dehiscence.<sup>4</sup> In his technique, one-side split pectoralis major muscle flap was turned over based on internal mammary artery perforators and the other side pectoralis muscle flap advanced to the defect based on thoracoacromial pedicle. In our technique, we modified the split pectoralis muscle upper flap that was islanded based on the thoracoacromial pedicle to achieve more mobilization, less bulging contour deformity, and use the dominant blood supply.

Before harvesting, which side of the internal mammary artery is used for revascularization of coronary arteries in case of post-CABG should be confirmed. Advancement pectoralis flap was designed on the side of the internal mammary artery harvested side. On the opposite side, split pectoralis muscle flap was designed (→ Fig. 1). The procedure was started with thorough debridement and sternal wire removal.

For split pectoralis major muscle flap harvest, the dissection was carried through sternotomy defect laterally on the superficial surface of the pectoralis major muscle to anterior axillary line superiorly up to 2 cm below to the clavicle and inferiorly up to the rectus sheath. Inferolateral border of the muscle was identified and insertion divided. If necessary small incision can be placed at the anterior axillary region to access the muscle insertion for division. The muscle was split along its fibers (→ Fig. 2A, 2B), careful avoiding injury to the pectoral branch vessel. The upper flap was islanded based on a pectoral branch by dividing all attachments of muscle. The lower half of the muscle was dissected from lateral to medial in the subpectoral space until internal mammary perforators (stopping 1 cm lateral to the internal mammary perforators), which nourish the lower half of the muscle. The upper flap was advanced, and the lower flap turned over to the defect.

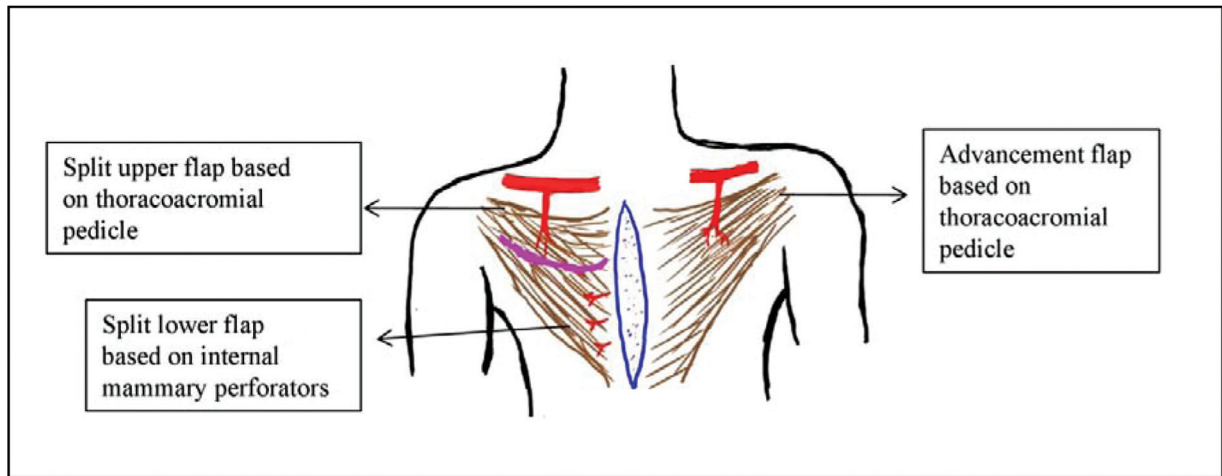
For harvest advancement pectoralis muscle flap (based on thoracoacromial vessels), the dissection was carried out through the sternotomy wound to laterally on the surface of muscle. Subpectoral dissection was performed medially from the inferolateral border to the defect, superiorly up to the pectoral muscle pedicle, and inferiorly up to the

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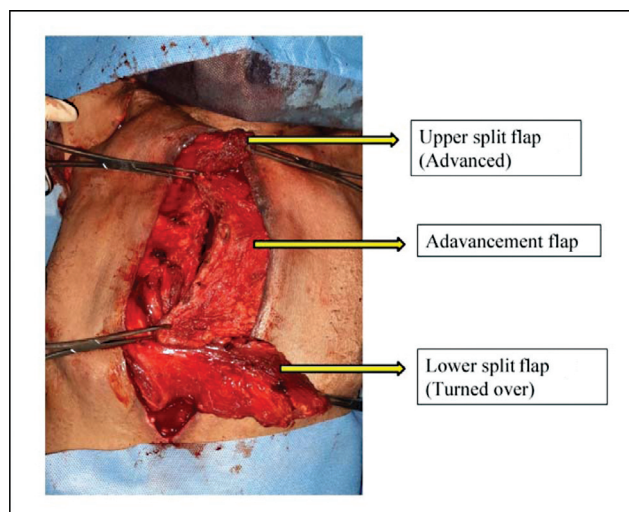
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**Fig. 1** Diagrammatic image of flap design.



**Fig. 2** (A) marking for split pectoralis major muscle flap. (B) Upper and lower split pectoralis major muscle flap.

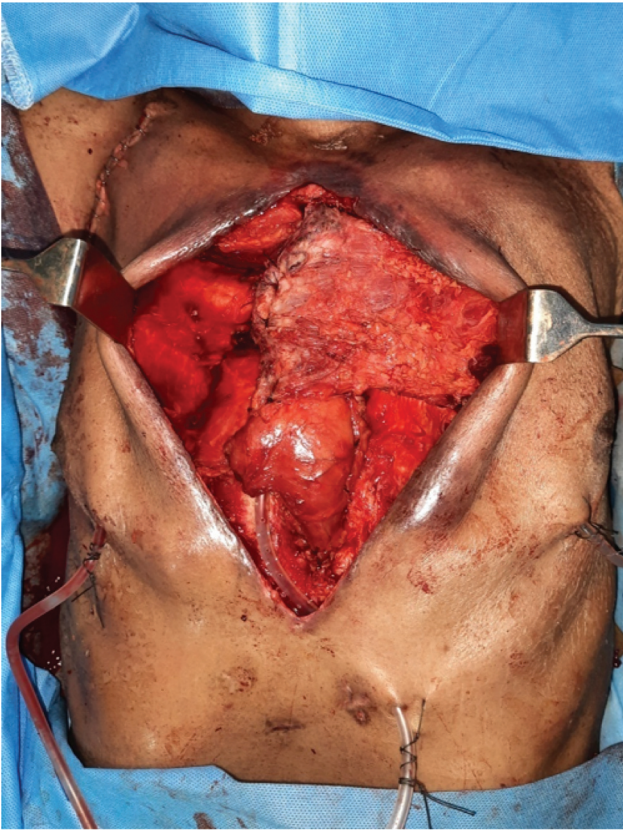


**Fig. 3** All flaps mobilized to defect.

rectus sheath. The flap was advanced medially to cover the middle and upper one-third defect.

Both side flaps were mobilized to the midline sternotomy defect (► **Fig. 3**), the split lower flap used to cover the lower third defect, the upper flap to cover the upper third defect and sutured with contralateral advancement muscle flap and also with the underlying sternum (► **Fig. 4**). Negative pressure suction drains were placed between flaps and also subcutaneous space. The skin wound can be closed by staples or sutures.

Anterior axillary fold contour deformity, bulge at the turnover point are the disadvantages of our technique. The limitation of the technique is patients with bilateral internal mammary artery harvest, as perforators must be intact for lower turnover flap. We suggest that using our technique, one can cover the whole sternal defect with split and advancement pectoralis major muscle flaps without requirement of additional flaps.



**Fig. 4** Final inset of the flaps.

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