

# Deltopectoral flap reconstruction with primary repair in a patient with cutaneous neck metastasis of thyroid cancer; a case report

A. I. Liyanage<sup>1</sup>, M.A.C. Lakmal<sup>1</sup>, Y. Abeywickrama<sup>1</sup>, D.D. Weerasekara<sup>2</sup>

<sup>1</sup>Colombo South Teaching Hospital, Sri Lanka

<sup>2</sup>Faculty of Medical Sciences, University of Sri Jayawardenepura, Sri Lanka

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### Introduction

The deltopectoral flap (DP flap) is the most commonly used fasciocutaneous [1], transpositional and axial flap, first described in 1917 Aymard for nose reconstruction. It was reintroduced by Bakamjian(1965) for pharyngoesophageal reconstruction [2].

Cutaneous metastasis of papillary thyroid carcinoma is rare. The reported prevalence of cutaneous manifestations was 0.06 - 0.82% [3]. The majority of metastatic skin lesions of papillary thyroid carcinoma involves the scalp(approximately two thirds), the remainder generally involve the head and neck region [4].

Here we report a case of a patient presenting with a cutaneous neck metastasis of papillary thyroid cancer after eight years of index surgery. He underwent wide local excision and deltopectoral flap reconstruction.

### Case presentation

A 65 year old male who underwent a total thyroidectomy in 2013 for papillary thyroid carcinoma, presented with a painless lump over the left root of neck for six months. The lump enlarged rapidly without significant pressure symptoms. Adjuvant radio-iodine therapy was completed. On examination, an approximately 8cm diameter, firm, hemispherical lump over the left anterior root of the neck extended to the upper chest. It was laying in the subcutaneous tissue plane but not attached to the deep structures.

CT revealed a well defined heterogeneously enhancing, subcutaneous soft tissue lesion in the left side of the neck measuring 8.3cm(Tr)\*5.5cm(AP)\*7.4cm(CC) (Figure 1). It was seen anterior to the left sternocleidomastoid muscle and clavicle, extending superiorly up to the level of thyroid cartilage, medially to the midline and inferiorly to the level of

sternum. Significant neovascularization noted around the lesion without perilesional fat stranding. The fat plane between the lesion and the sternocleidomastoid muscle was obscured. There was no evidence of local lymphatic and lung/bone metastasis. Thyroglobulin was very high at 3347 ng/ml suggestive of recurrence. Fine needle aspiration cytology confirmed the recurrence of thyroid papillary carcinoma.

Wide local excision(WLE) of the lump and reconstruction of the skin defect using either the deltopectoral flap, the pectoralis major myocutaneous flap or the latissimus dorsi flap and free flaps were planned at a multi disciplinary team meeting. Ultimately, the deltopectoral flap was considered. Pulsations of 2nd, 3rd and 4th perforator arteries were confirmed by doppler preoperatively.

WLE of lump with adequate skin margins was performed. A deltopectoral fasciocutaneous flap designed and elevated along with the 2nd, 3rd and 4th perforator arteries. Bleeding from the distal edge of the flap was enough to confirm the blood supply of the flap, despite sacrificing the branch of thoracoacromial artery. The direct closure of the surgical wound and the donor site in the setting of the DP flap using suction drains and without a skin graft was performed (Figure 2).

Post operative period was uneventful. The histopathology was reported as a cutaneous metastatic deposit of a papillary thyroid carcinoma with complete resection margins.


The patient was referred to an oncologist for adjuvant radioiodine therapy and planned to observe for recurrences and metastasis. The range of movements of the left shoulder was improved with physiotherapy and no scar contracture developed around the flap (Figure 3).

### Discussion

Papillary thyroid carcinoma is the most common subtype of thyroid cancer, rarely metastasis to the skin. Several mechanisms for development of metastatic skin deposits have

Correspondence: A. I. Liyanage

E-mail: laindunil@gmail.com

 <https://orcid.org/0000-0003-0579-7998>

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been proposed; direct extension, hematogenous and lymphatic spread and the implantation of cells during biopsy or surgery [5]. Cutaneous metastasis of thyroid cancer usually presents as slow growing dermal nodules or plaques whereas in our case a painless subcutaneous lump appeared in the root of the neck over the period of six months. It is surprising that the metastasis presented eight years after the primary surgery for papillary thyroid cancer even after completion of radio-iodine therapy.

Wide local excision of metastatic skin lesion followed by radioactive iodine therapy was planned. The deltopectoral flap is considered as the first choice in most cases of advanced thyroid surgeries, unless the defect is too large [6]. Therefore a large skin defect as seen in our patient deltopectoral flap cover is preferred.

The flap is rectangular in shape and transfers the skin from the deltoid and thoracic region. It relies on the blood supply of the 2nd , 3rd and 4th intercostal perforators of the internal thoracic artery, usually requiring skin grafting to the donor site.

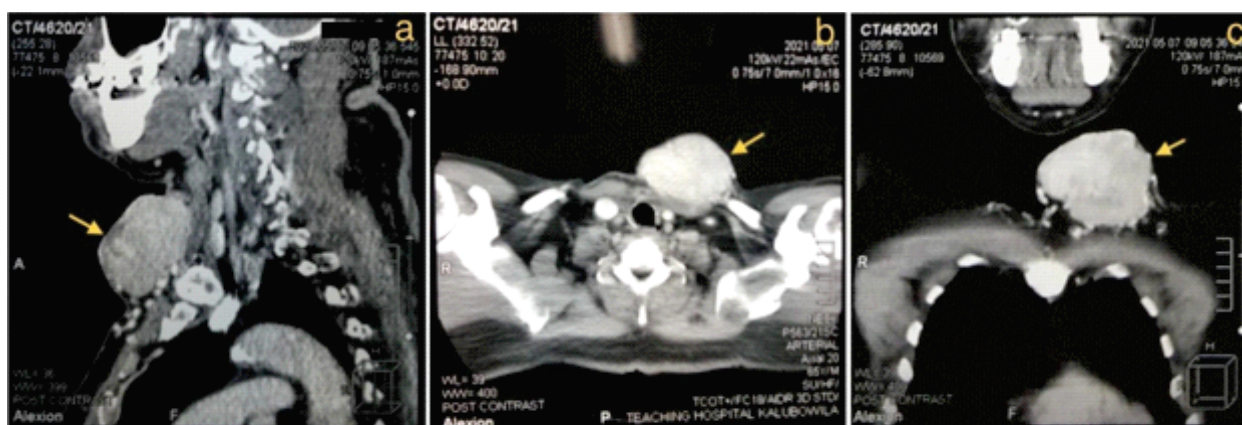
The DP flap is considered over the pectoral myocutaneous flap and the latissimus dorsi flap because of its unique design and vascularity best suit for our patient. It is thin, pliable and has excellent colour & texture matching with the head and neck area. The flap vascularity enables quick and easy harvest. Thus the DP flap minimizes the donor site morbidity and improves the cosmetic outcome of both donor and recipient sites.

Skin grafting usually requires donor site coverage but in our case the donor site managed with advancement of surrounding flaps. We prevented the distal flap necrosis by tension free flap reconstruction.

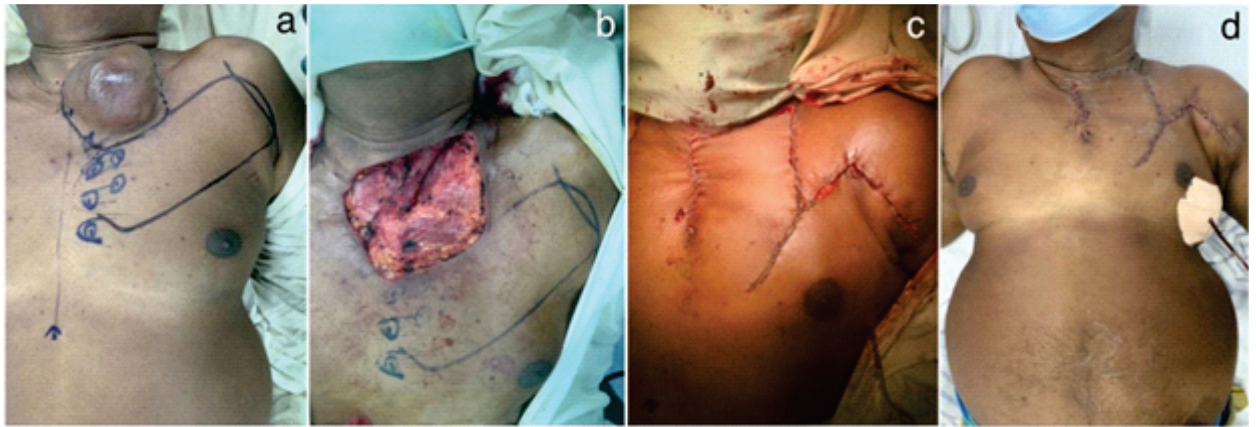
Therefore the DP flap is considered a first choice in most cases of skin defect caused by radical surgeries for the treatment of thyroid cancer. Despite the advancement of microsurgery, we have found the deltopectoral flap to be very useful in patients who require reconstruction of the lower face or neck region. It is necessary to confirm the survival of 2nd intercostal perforator artery, which is the most important nutrient vessel of the DP flap by doppler preoperatively as well as presence of bleeding from the distal edge of flap intraoperatively.

## Conclusion

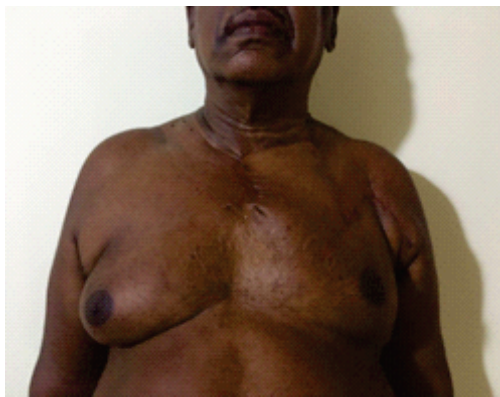
We found the effectiveness of using the deltopectoral flap is a reconstructive option for patients with thyroid cancer who undergo radical surgery, resulting in skin defect. This flap does not always require skin grafting to the donor site.



**Figure 1:** CT images (a) sagittal, (b) axial and (c) coronal sections of the neck region; arrows showing the lump.



**Figure 2:** tographs of wide local excision(WLE) of lump and deltopectoral flap reconstruction; (a) The flap design and landmarks were drawn on the patient's skin. 2nd, 3rd and 4th perforator intercostal arteries were marked using doppler stethoscope. (b) Surgical wound following WLE of the lump. (c),(d)Final outcome of the patient. The donor site of the flap was closed directly by undermining the wound edges of the incision. Suction drains were fixed without air leak.



**Figure 3:** A photograph of the outcome of the patient at postoperative three months

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**Learning Points:**

- Metastatic manifestations of papillary thyroid cancer are possible several years after the primary surgery and adjuvant therapy therefore proper surveillance and prompt diagnosis of metastasis and recurrences are necessary.
- Although there are several mechanisms for metastasis of thyroid cancer; Implantation of cells during biopsy or surgery would be the possible explanation in this case.
- Deltopectoral flap as a reconstructive option for radical thyroid cancer surgeries in Onco-plastic and general surgeons armamentarium.
- Skin grafting to the donor site is not always necessary for deltopectoral flaps, hence the method of reconstruction should always be decided on an individual basis.