



The versatility of the Karapandzic flap: A review of 65 cases with patient-reported outcomes



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ABSTRACT

Objective: The Karapandzic flap is an established technique for reconstruction of large lip defects and in our experience is particularly valuable in repair of the upper lateral lip and the commissures as well. We present our experience in a case series of 65 patients under one consultant.

Method: This is a retrospective study of patients who underwent Karapandzic flap repair for lip defects following cancer resection from 2007 to 2014 in North Yorkshire. A data collection tool was used which incorporated patient demographics, tumour location, histology, complications, resection margins and recurrence including functional and aesthetic outcomes. The Patient and Observer Scar Assessment Scale (POSAS) was used to assess postoperative outcome at more than 1 year.

Results: The clearance rate was 98.4%. For those with a follow-up greater than 1 year, there was no recurrence or surgical revision, whilst the most common concern was temporary lip paraesthesia. The mean POSAS scores were low for both patients and observers reflecting a high satisfaction rate.

Conclusion: The technique of Karapandzic flap reconstruction for defects in both upper and lower lip allows adequate margin clearance with a low level of complications. The advantages of this technique include preservation of both function and sensation utilising local tissue to allow successful aesthetic outcomes.

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1. Introduction

There are many techniques described for reconstruction of defects in both the upper and lower lips. In 1974, Karapandzic reported his technique for repairing lip defects using local arterial flaps based on the branches of the facial artery. He suggested its use in cases of repair following cancer ablation that had also been irradiated and hence the blood supply of other local flaps was inadequate. Forty years later, the Karapandzic flap is still an important reconstructive option, suitable for most lip defects. The basic principles of dissecting and sparing the neurovascular structures and advancing the skin flaps with minor disruption to the orbicularis oris muscle have not changed significantly. There have been minor modifications to extend its use for larger defects and as well as a unilateral technique. Previous studies have alluded to the

adaptability of this reconstructive technique (Ethunandan et al., 2007). Although Karapandzic himself stated that he had the best results reconstructing midline defects of the upper and lower lip, our experience and this study shows that the versatility of this flap lends itself to the reconstruction of most lip defects, including those involving the commissures. Herein we report the subjective and objective outcome of reconstruction of a variety of lip defects with this flap.

2. Materials and methods

This was a retrospective study in which patients who underwent a Karapandzic lip reconstruction were identified between 2007 and 2014. Data were collected from York Teaching Hospital and Harrogate General Hospital in North Yorkshire, United Kingdom. A data collection tool was used that collected demographic data, site of the defect, histology, the dimensions of resection and any complications recorded. Functional outcomes were assessed in terms of preservation of lip competence and sensation, and facial expression, including use of cutlery and ease of

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denture usage. Patients were invited for follow-up at least 1 year posttreatment for clinical assessment of the outcome using the Patient and Observer Scar Assessment Scale (POSAS). In the patient scale, the parameters graded included the pain, itching, colour, stiffness, thickness, and irregularity of the scar as reported by each patient. In the observer scale, the parameters graded included the vascularity, pigmentation, thickness, relief, pliability and surface area of the scar as assessed by the clinician. Each parameter was rated from 1 to 10, with 10 as the worst outcome. Therefore, for each scale, scores can range from 6 (the best) to 60 (the worst).

2.1. Surgical technique

The classical Karapandzic technique is described in the literature. The muscles are the circumferential fibres of the orbicularis oris muscle that encircle the oral sphincter and the elevators and depressors that radiate from the outer margins with the neurovascular vessels. The lip lesion was resected in full thickness as a rectangle, adjusting the angles, as it is crucial to maintain equal length on the lateral and medial edges (Fig. 1). The flaps are then developed, and traditionally, incisions are bilateral through the skin and subcutaneous tissues in or matching the natural skin creases or the lines of relaxed skin tension, with blunt dissection in a radial manner to preserve the nerves and vessels. Muscle fibres are split, not cut, with the muscle release being greatest at the flap margin closest to the resection. Our modifications allow for unilateral flaps to be used for defects close to and involving the commissures. For lateral resections, differential suturing is mandatory at the vertical junction in order to match the disparity of the thicker medial lip and the thinner lateral lip. Thinking three-dimensionally, differential suturing will address the disparity in both the tissue bulk and the mucosa. Therefore, it starts with the suturing of the muscle and the deeper tissues (Fig. 2). Muscle-to-muscle sutures or muscle to dermal sutures adjusted differentially will allow final cutaneous alignment of the vermilion. The vermilion border is aligned early (Fig. 3) and the excess tissue on the medial aspect is drawn inward along the mucosa. Any defect is thus transferred intraorally (Fig. 4). When the commissure is involved, there can be blunting after rotation of the flap. However, we have found that as muscle action is preserved, significant improvement will occur naturally as the patient smiles, eats, and talks. A commissuroplasty is available but rarely needed. Lateral upper lip defects are highly appropriate for unilateral Karapandzic flap reconstruction and lead to excellent functional and aesthetic results, significantly better than those achieved by wedge excision alone. The combination of a stable medial aspect of the defect, including the alar base and an aggressively freed lateral flap, will allow reconstruction of the majority of upper lip lateral defects. Only very large defects (50% or

more of the lip) will routinely require bilateral flaps. The use of resorbable sutures with this technique has further made this technique more appealing both to the patient and to the surgeon. 4–0 Vicryl Rapide (Ethicon) sutures are preferred for closure of the deep layer and 6–0 Vicryl Rapide (Ethicon) sutures for closure of the skin. No sutures need to be removed, which is reported as greatly appreciated by the patients; the 6–0 Vicryl Rapide lasts approximately 2 weeks, conveying greater retention at the suture line without any increase in local wound concerns or any decrease in aesthetic outcome. Whether unilateral or bilateral, success of the flap is based on the laxity of the tissues and balanced forces, which seems to minimize tissue distortion. Therefore, the role of the muscle forces in the postoperative recovery phase is a dynamic process and scar maturation is a passive process, with both working together to improve appearance.

3. Results

A total of 65 patients (27 male, 38 female) were included in the study and represented the cohort that underwent Karapandzic reconstruction between 2007 and 2014. The age of the patients ranged from 41 to 100 years (mean, 73.4 years). Table 1 shows the distribution of the histology with the site. Just over half of the cases (52.31%) were cutaneous squamous cell carcinomas, with most of them occurring in the lower lip (33.85%). The majority of the lesions on the upper lip were basal cell carcinomas (35.38%).

The extent of the resection (tumour and margin) varied from 1.0 cm to 3.6 cm, with a mean of 2.0 cm in the lateral to medial aspect. These histological measurements must be viewed in light of the known shrinkage of specimens. The rate of complete excision was 98.4% (only 1 of 63 patients had an involved margin); this was excluding two reconstructions following Mohs micrographic surgery.

Most of the defects were unilateral reconstructions (75.39%), and 13.85% of these involved the commissure, as shown in Table 2.

As shown in Fig. 5, the most common complication reported was altered sensation, followed by tightness of the lip. Most of these symptoms improved with time. Fourteen patients were reviewed after more than a year after their surgery to assess the clinical outcomes using the POSAS tool. The mean scores were 11.1 (patient) and 12 (observer). Seven patients were further asked to give an overall score for their outcome, and the average was 2.4.

Large upper lip defects, as in Fig. 6, would require bilateral flaps. However, good results are still obtained. Incisions can be camouflaged into the natural folds of the face (Fig. 7).

Blunting after reconstruction is commonly seen with defects involving the commissure. As a result of natural muscle forces, the

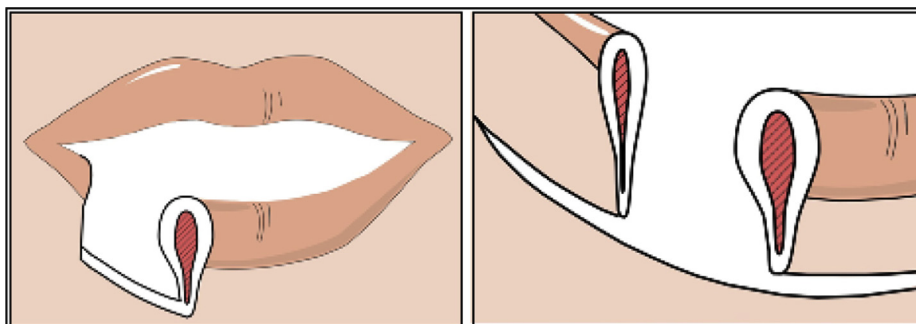


Fig. 1. The vertical dimension is maintained between the lateral and medial edges.

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