

The Study of Utility of Single Drop Neck Incision for Neck Dissection

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ABSTRACT

Background: Neck dissection forms integral part in the radical treatment of carcinoma of the oral cavity. In this study, we have examined usefulness of the single drop neck incision.

Materials and methods: All the patients with carcinoma of oral cavity which were operated with the single drop neck incision were studied as they were called for follow-up. Their complications, cosmetic outcome and range of shoulder and neck movements were studied.

Results: Total 32 patients were eligible for the study. Average follow-up was about 7 months (1-16 months). Twelve (38%) patients had difficulty in lifting weights and doing manual work at occupation like farm work, etc. Four (12.5%) patients were not happy with their cosmetic outcome. Three (9.4%) patients had hypertrophied scar. One patient had severe trismus and four (12.5%) had marginal skin necrosis.

Conclusion: This study concluded that the single drop neck incision is a very useful tool to perform neck dissection with acceptable morbidity with good postoperative cosmetic outcome.

Keywords: Neck dissection, Single drop neck incision, Incisions for neck dissection flap reconstruction.

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INTRODUCTION

Neck dissection is an important component of the surgical management of oral cavity squamous cell carcinomas. The neck dissection has gone through various modifications since its inception and is approached through many different kinds of neck incisions and their modifications. Here, we describe our results of neck dissection done through the modified single drop neck incision.

MATERIALS AND METHODS

This study was conducted at a tertiary cancer centre in rural India in department of surgical oncology. All

patients of carcinoma of the buccal mucosa, gingivobuccal sulcus (GBS) and lower alveolus who had involvement of the skin over cheek were treated by composite resection and neck dissection which was done through the single drop neck incision.

The procedure for single drop neck incision was as follows:

This incision was used in patients of carcinoma of the buccal mucosa or GBS or alveolus where part of skin of the cheek needed to be removed with the primary tumor in view of the actual skin involvement or the skin being very close to the tumor for adequacy of margins. The incision was started at the lateral edge of the skin defect planed. It should be at right angle to the defect to avoid acute angles. Then the incision was carried to the angle of mandible. Then it followed along the anterior margin of trapezius muscle down in the neck with a gentle curve posteriorly till the clavicle at the junction of middle and lateral one-third. The anterior skin flap was elevated till the midline. The posterior skin flap was elevated to dissect all level V lymph nodes. Through this incision, level I to V lymph nodes were removed with or without nonlymphatic structures, decided based on status of lymph nodes in neck.

All the patients were called for follow-up and examined. Only patients who were not having local recurrence or who were available for follow-up were taken up for the study. They were asked regarding history of pain in neck and shoulder, restriction of daily activities, problem in lifting weights and self care. They were also examined to detect any complications of neck dissection like scar contracture, shoulder drop, scapular deformity and for cosmetic outcome. Range of neck and shoulder movements were noted with the goniometer. All the findings were noted and complications of neck dissection were studied.

RESULTS

Total 51 patients were operated from October 2011 to August 2013, at our institute with the single drop neck incision. These patient examination and collection of data was done in September 2013. Ten patients had recurrence, so they were not included in study. Nine patients were lost to follow-up. Thirty-two patients were found eligible

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for the study and were included in the study. Thirty-one were males and only one was female. Age range was 26 to 82 years (mean age 61 years). These were the cases of carcinoma of oral cavity involving skin of cheek where skin excision was necessary for the clearance of the tumor. Average follow-up was 7 months with range from 1 to 16 months. Three patients had not undergone radiotherapy, out of which two were operated one month back which were about to start their radiotherapy. One patient was defaulted for radiotherapy. Rest of the patients being locally advanced oral malignancies have undergone radiotherapy. Eight (25%) patients had pain in the neck and the shoulder region on and off particularly while performing activities, like lifting weights and at extremes of shoulder movements. Average pain score was 4.8 on visual analog scale (VAS) of 0 to 10. All patients were able to perform their routine activities. Twelve (38%) patients told that they have difficulty in lifting weights and doing manual work at occupation like farm work, etc. Four (12.5%) patients did not have satisfactory cosmetic outcome. Three patients had hypertrophied scar and one had severe trismus. Out of patients with hypertrophied scar two were reoperated for flap necrosis—one was a deltopectoral flap and the other was free fibula osteocutaneous flap. Marginal necrosis of neck flap was found in four (12.5%) patients. Complications are summarized in Table 1.

For analysis, patients were divided into the early postoperative group (≤ 6 months) and the late postoperative group (> 6 months). Average neck and shoulder range of movements are given in Tables 2 and 3. There was significant improvement in shoulder movements in the late postoperative group as compared to early postoperative group. Lateral flexion of neck did not improved over time but the flexion and extension of the neck was better in the late postoperative group.

DISCUSSION

Neck dissection forms the most integral part of treatment of oral cavity malignancies. When the chances of neck nodal metastasis in an oral cavity squamous cell carcinoma are increased more than 20%, the neck needs to be addressed. Management of the neck can be in the form of surgical neck dissection or radiotherapy.¹

Neck dissection evolved from radical neck dissection in early 20th century, to present day selective neck dissection. The radical neck dissection involves removal of level I through V neck nodes with nonlymphatic structures like sternocleidomastoid muscle, spinal accessory nerve and internal jugular vein. When one or all of these structures are preserved, then it is called modified neck dissection.

When one or more levels of lymph nodes are selectively removed, it is called selective neck dissection.^{2,3}

Many types of incisions have been described for the neck dissection since its inception. Commonly used incisions are modified: Crile's incision, Schobinger incision, McFee incision, Hockey stick incision, etc. Here, we have described a single drop neck incision which is a modification of incision taken for cervicodeltopectoral (CDP) flap.^{4,5}

Different authors have described and studied different types of incisions for neck dissection. Crile in early 20th century described neck block dissection for oral cavity malignancies. Modified Crile's incision is still one of the most popular neck dissection incision.² But the problem with Crile's incision is a tri-pointer in neck and with excision of cheek skin, the flap becomes narrow fearing the flap necrosis. Baoguo Liu et al studied unilateral hockey stick incision for neck dissection. They have found it was a very versatile and useful incision with good exposure.⁶ Similarly, William MacFee used two transverse neck incisions for the neck dissection. According to author, it was anatomically sounder to take transverse incision in neck which gives cosmetically better scar.⁷ Today, MacFee incision is particularly used in postradiotherapy cases, where it reduces chances of skin flap necrosis. It has a bridge of skin at level III nodal station which needs to be retracted up and down to have the exposure. This makes surgery a little difficult and, due to hard retraction sometimes, the vascularity of the skin bridge may become a problem. Modified Conley's

Table 1: Morbidity

Problem	No. of patients
Scar hypertrophy	3
Marginal necrosis of skin	4 (12.5%)
Poor cosmesis	4 (12.5%)
Parotid fistula	1
Reconstruction flap necrosis	1
Difficulty in lifting weights	12 (38%)
Pain in shoulder and neck	8 (25%)

Table 2: Neck movements

		<i>Ipsilateral flexion</i>	<i>Contra-lateral flexion</i>	<i>Flexion</i>	<i>Extension</i>
<6 months	19	48 (10)	43 (12)	38 (17)	50 (8)
>6 months	13	49 (13)	48 (16)	49 (4)	58 (4)
		p = 0.807	p = 0.320	p = 0.030	p = 0.002

Table 3: Shoulder movements

		<i>Flexion</i>	<i>Abduction</i>
<6 months	19	104 (21)	100 (15)
>6 months	13	120 (13)	153 (20)
		p = 0.021	p = 0.000

incision was studied and compared with other incisions by Lasaridins N et al⁸ in a small series of 23 patients and it was found to be very useful in post-radiotherapy (RT) setting. In a study from Royal Masden Hospital, the triradiate and the McFee incisions were compared with the apron flap incision in which they have found no difference in complications between the three, but the wound dehiscence was more with the triradiate incision in post RT cases. So, they recommended the apron flap incision in post RT cases as access wise it is better than McFee incision.⁹

Cervicodeltopectoral flap is one of the useful flaps for covering cheek defects after oral cavity resection which was described by Backer for first time.⁵ We have modified it and restricted its extent up to the clavicle. It forms a large anterior flap which has a very rich blood supply and only a small posterior flap. We have also avoided acute angles and tri-pointer with this flap. This reduces chances of flap necrosis. We had only four cases with marginal skin necrosis which were managed conservatively. To avoid it further, we have cut the platysma with knife and not with cautery and we have also tried to avoid shearing between the skin and the platysma for better result.

Anterior neck flap has some pliability, so it can be rotated upward to cover-up small skin defects on cheek. For mucosal lining, the pectoralis major myocutaneous (PMMC) flap was used in most of the patients (n = 18). The other flaps used were deltopectoral (n = 2), CDP flap (n = 2) and free flaps (n = 2). In eight patients, primary closure of neck skin was done as the defect was small. The single drop incision can be effectively used with these flaps as shown in Figure 1, where bipaddled PMMC is used for primary reconstruction.

It is said that the incisions which are perpendicular to the scar lines of body tend to form hypertrophied scar and bad cosmesis.¹⁰ However, in our study, only

two patients had contracture. They were mainly due to complication like flap necrosis, re-surgery and delayed healing. Eighteen (85%) patients in our study had satisfactory cosmetic outcome. As there is no scar in front of neck, this incision gives very good cosmetic outcome as seen in Figure 2 which shows cosmetic result at 1 year follow-up with postoperative radiotherapy.

In our study, it was seen that as time elapsed from the surgery, all the shoulder movements improved significantly. But, neck movements were only marginally improved. Ranges of movement in early and late postoperative period are summarized in Table 3. In all the cases, the spinal accessory nerve was preserved. But, it generally goes into paresis postoperatively, which gradually recovers and this gives better function in late postoperative period. It was seen that shoulder and neck pain was seen more in the patients who had not done their physiotherapy well and they had comparatively poor range of neck and shoulder movements. Similar improvement in shoulder function was observed in a study done by Lavericks who compared the neck dissection unilateral *vs* bilateral with patients treated without the neck dissection.¹¹

Twelve patients reported that they had difficulty in lifting weights, five of whom had pain in shoulder or neck. This may be due to nonfunctioning spinal accessory nerve, lack of physiotherapy and some amount of shoulder joint capsulitis. In all of these patients, PMMC flap was used which lead again to weakness of shoulder. Similar study was done by Wilgen et al and they observed that, in 28% patients, there was significant decrease in sensations and disabilities after supraomohyoid neck dissection.¹² Giordanoc L et al studied neck morbidity after neck dissection who reported significant decrease in range of movements of the neck and pain in the neck and the shoulder along with sensory loss. This was attributed to level IIB dissection leading to damage to



Fig. 1: With bipaddled PMMC



Fig. 2: Long-term follow-up

spinal accessory nerve.¹³ So, neck dissection itself is a surgery that causes morbidity beyond doubt; however, these do not seem to accentuate with this particular single drop neck incision.

CONCLUSION

Considering our results in this small series, it can be inferred that single drop neck incision is a valid modification. It is of particular utility in patients who are going to land up with skin defects in cheek. It is logical to use this incision in selected patients effectively.

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