

Comparison of the Complication Between the Radical Neck Dissection & Selective Neck Dissection for the Patient of Oral Squamous Cell carcinoma

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ABSTRACT

Objective: To compare the outcome of the radical neck dissection and selective neck dissection for control of the disease in those patients who have their nodal involvement localized to level I, II, III.

Study Design: Prospective Randomizing Study.

Place and Duration of Study: This study was conducted in Oral and Maxillofacial Surgery Department, Mayo Hospital, Lahore from 1st January to 31st December 2001.

Materials and Methods: The study was conducted in dental section, Mayo hospital, Lahore. Thirty patients of squamous cell carcinoma of oral cavity were selected and randomly divided into two groups. Group I was subjected to selective dissection of the tumour while group II was subjected to radical neck dissection. Postoperative complications were recorded each follow up visit.

Results: Post operatively, in group I secondary hemorrhage occurred in 26.7% while in group II, it occurred in 40.0%, group I showed delayed healing due to infection in 46.7% while in group II, it was 73.3 %. In group I and group II, there was no recurrence after 1 month, 3 month and 6 month. After 9 months recurrence was noted in groups. It was 20% in group I while 6.7% in group II.

Conclusion: Selective –neck dissection should be preferred in the patient of oral squamous cell carcinoma with level I,II, III lymph node involvement as compared to radical neck dissection however recurrence rate is higher in patients undergoing selective neck dissection as compared to patients undergoing radical neck dissection.

Key Words. Oral squamous cell carcinoma, Radical neck surgery, selective neck, dissection.

INTRODUCTION

Oral squamous cell carcinoma is the 6th most common cancer world wide.¹ Head and neck malignancies also represent 7% of newly diagnosed cancers.²

The treatment of the neck in patients with squamous cell carcinoma of the head and neck region continues to be one of the most controversial issues in head and neck oncology. The evolution of the treatment of the neck is a good maximize tumor control and minimize morbidity to each patient with the passage of time.³

The radical neck dissection remains the basic tool for managing cervical metastasis.⁴

The radical neck dissection is defined as the en block removal of the lymph node bearing tissues for one side of the neck The resected specimen included the spinal accessory nerve, the internal jugular vein, and the sternocleidomastoid muscle.³

Removal of the primary tumor and the lymphatic system of the neck should be carried out to prevent further tumor dissemination to occur in any direction.⁵

The routine removal of the spinal accessory nerve was advocated later to decrease operating time and increase the certainty of the total neck node removal of the cervical lymph nodes.⁶

In the 1950s it was advocated that a cervical lymph adenectomy for cancer was not adequate unless all the

lymph node bearing tissue of one side of the spinal accessory nerve, the internal jugular vein and the sternocleidomastoid muscle were included in the resection.⁷

Removal of this muscle facilitates access to the jugular vein and the removal of the lymph node bearing tissues of the neck. However, muscle removal is no longer justified for ease of dissection or exposure alone.^{3,5} most head and neck surgeons today would agree that a radical neck dissection is not indicated in the absence of palpable cervical metastasis.⁸

Radical neck dissection is indicated when there are multiple clinically obvious cervical lymph node metastasis, there is a large metastatic tumor mass or there is multiple matted nodes in the upper portion of the neck.

Radical neck dissection carries a significant morbidity as many normal anatomical structures are sacrificed.³

In 1960s the surgeons modified the concept of the radical neck dissection by selectively removing only those lymph node groups that were based on the location of the primary tumor and were at highest risk of containing metastasis.⁹

Selective neck dissection is defined as en bloc removal of only those Lymph node groups which are most likely to contain metastasis depending on the location of the primary tumor.³

En bloc removal of the nodes at highest risk for metastasis is anatomically justified; it has the same therapeutic value and provides the surgeon with the same staging information as the more extensive radical and modified radical neck dissection and it is associated with less postoperative morbidity.¹⁰

The studies have demonstrated that the lymphatic drainage of mucosal surfaces of the head and neck region follows relatively constant and predictable routes.^{11,12}

A study reported no metastasis in the nodes of the posterior triangle of the neck in radical neck dissection specimens, regardless of the site of the primary tumor and the presence or absence of metastasis in the jugular nodes.¹³

Different surgeons reported their experience with several hundred cases of neck dissection in which they spared the internal jugular vein and the sternocleidomastoid muscle during the neck dissection with out altering the disease-free rates.^{14,15}

The decision of selection between these two is often dependent on the extent of regional disease or evidence of extra capsular spread of the tumor in to the adjacent structure.¹⁶

Selective neck dissection produces minimal dysfunction of the trapezius muscle which is usually temporary and reversible.^{16,17}

Preservation of sternocleidomastoid muscle renders good soft tissue cover over carotid vessels and result in normal neck contours. Excision of internal jugular vein results in decrease in venous return and risk of secondary hemorrhage.

If these structures can be preserved with out compromising the disease control, the morbidity of surgery can be minimized.

This study is intended to compare the outcome of the radical neck dissection and selective neck dissection for control of the disease in those patients who have their nodal involvement localized to level I, II, III.

MATERIALS AND METHODS

This was a randomized controlled trial conducted in the department of oral and maxillofacial surgery, king Edward Medical College /Mayo Hospital, Lahore. Consecutive sampling was done to collect the sample. Thirty patients were selected according to the set inclusion criteria from out patient department who presented with squamous cell carcinoma of oral cavity along with level I, II, III lymph node involvement. Patients with recurrent disease, evidence of distant metastasis, evidence of other malignancy along with oral tumor and those who were medically unfit for surgery were excluded from the sample so that bias in the study results can be controlled.

Informed consent from all patients was taken. The patients were ensured about the confidentiality of the information given by them. Patients were divided

randomly into two groups irrespective of sex of patients under study. In group I, selective neck dissection along with excision of tumorous mass was done while in group II Radical neck dissection along with excision of tumorous mass was done. All cases in the study were followed up from 1st January 2001 to 31st December 2001 at intervals of one month, three months, six months and nine months. At each follow up visit outcome in terms of infection, recurrence, metastasis were checked and recorded.

RESULTS

Thirty patients enrolled from the out patient department were included in the study group according to the inclusion criteria. The patients were randomly divided into two groups: group I and group II.

In group I, surgical excision of tumorous mass along with selective neck dissection was done while in group II, surgical excision of tumorous mass along with radical neck dissection was done .

In group I, the mean age was 53 ± 16.2 years with a range of 40-65 years while in group II , the range was 33-47 year with a mean of 49 ± 11.8 years.

Post operatively, in group I secondary hemorrhage occurred in

26.7% while in group II, it occurred in 40.0%. Group I showed delayed healing due to infection in 46.7% while in group II, it was 73.3 %. Follow up was done over a period if 1 year on quaterly basis.

In group I and group II, there was no recurrence after 1 month, 3 months and 6 months. After 9 months, recurrence was noted in groups. It was 20% in group I while 6.7% in group II.

Table No.1: Showing means age and standard deviation (std deviation) of age in Groups undergoing selective neck dissection and radical neck Dissection.

N	Mean age*	Std deviation
Selective neck 15 Dissection	52.8	16.2
Radical neck 15 Dissection	49.1	11.8

Table No.2: Complications following selective and radical dissection of neck.

Complications	Selective dissection (n=15)		Radical Dissection (n=15)	
	Number	%age	Number	%age
Hemorrhage*	4	26.7	6	40.0
Delayed healing:	7	46.7	11	73.3
Metastasis after:				
3 Months	0	0.0	0	0.0
6 Months	0	0.0	0	0.0
9 Months	3	20.0	1	6.7

*Chi-square test with n-1, df, (p<0.05)

DISCUSSION

This study was conducted in oral and maxillofacial surgery department, Mayo Hospital, Lahore from 1st January to 31st December 2001.

Total number of 30 cases were selected and divided at random in two groups irrespective of sex of patients under study, comprising of 15 cases in each group. Group I under went selective neck dissection along with surgical excision of tumorous mass while radical neck dissection along with surgical excision of tumorous mass was done in group II.

The main purpose of this study was to compare post operative complication like secondary haemorrhage, delayed healing, shoulder prop and recurrence in both surgical procedures and to find out the best surgical option for the management of cervical lymph node metastasis.

Leipzig et al studied 109 patients, who had undergone various types of neck dissection, utilizing preoperative and postoperative observations of shoulder movement. They concluded that any type of neck dissection may result in impairment of function of the shoulder. They noted that dysfunction occurred more frequently among those patients in whom the spinal accessory nerve was extensively dissected or resected.¹⁸

In 1985, Sobol et al. performed a prospective study in which preoperative and postoperative measures of shoulder range of motion were compared. Shoulder range of motion was better in patients who underwent a nerve-sparing procedure than in patients who had a radical neck dissection.¹⁷

In our study spinal accessory nerve was sacrificed only in group II (radical neck dissection) while in group I (selective neck dissection) there was no such complication.

Byers RM (1985) concluded that obstruction of one or both jugular veins, particularly when combined with lymphadenectomy, results in lymph oedema of the face.¹⁹

In our study, there was no such complication like lymph oedema of the face due to the obstruction of the jugular vein in both groups but both groups showed secondary haemorrhage which was 26.7% in group I (selective neck dissection) while 40.0% in group II (radical neck dissection).

Hirate RM, Jaques DA et al, (1975) concluded that the combination of infection and local ischemia of skin or mucosa may result in wound infection, suture line break and flap necrosis.²⁰

In our study there was no such complication like ischemia of skin or mucosa, flap necrosis except, in group I (selective neck dissection), delayed healing occurred due to infection in 46.7% while delayed healing, due to infection, occurred 73.3% in group II (radical neck dissection).

Raymond J. Fonseca (2000) documented that even with T1 and T2 lesions, selective neck dissection improved the 5 year survival rate to 86% of patients as compared with only 55% in a group who underwent radical neck dissection only after nodal disease became recognized.²¹

Casumano RJ, Persky MS concluded that the squamous cell carcinoma has a high recurrence rate. 89% of patients showed locoregional recurrence within 2 years of therapy.²²

In our study, metastasis along with recurrence occurred in 4 patients out of 30 in which 3 patients were in group I (selective neck dissection) and 1 patient in group II (radical neck dissection).

In group I (selective neck dissection), 3 patients showed the metastasis at the level IV in which 2 patients underwent radical neck dissection but 1 patient refused for second surgery, was referred to radiotherapy department.

In group II (radical neck dissection), 1 patient showed the metastasis at level V, refused for second surgery, was referred to radiotherapy department.

There are some limitations in our study like small sample size and short duration of the study. To further look into the matter we need large sample size and longer follow up duration to find exactly the late complications and recurrence in these patients.

CONCLUSIONS

Selective neck dissection should be preferred in the patient of oral squamous cell carcinoma with level I, II, III lymph node involvement as compared to radical neck dissection due to the following conclusions drawn on the basis of this study:

1. Post-operative complication rate is less in patients undergoing Selective neck dissection as compared to patients undergoing Radical neck dissection.
2. Recurrence rate is higher in patients undergoing selective neck dissection as compared to patients undergoing radical neck dissection.
3. Overall prognosis of the patients undergoing selective neck dissection was better even after the recurrence, as radical neck dissection could be done in that case as salvage procedure.

REFERENCES

1. Boyle P, Macfarlane GJ, Maisonneuve P, Zheng T, Scully C, Tedesco B. Epidemiology of mouth cancer in 1989: a review. *J Roy Soc Med* 1990; 83:724-30.
2. Krouse JH, Krouse HJ, Fabian RL. Adaptation to Surgery for Head and Neck Cancer. *Laryngoscope* 1989; 99: 789-94.
3. Medina JE, Rigual NM. Neck dissection. In: Cummings CW, Fredrickson JM, Harker LA, Krause CJ, Schuller DE, editors. *Otolaryngology* _

- Head and Neck Surgery. 2nd ed. Philadelphia: Mosby year book;1993.p.1649-72.
4. Lingman RE, Shellhammer RH, Management of Tumours in the Neck- Malignant Tumours. In: Thawley ES, Panje WR, editors. Comprehensive management of head and neck tumours. Philadelphia (USA):W.B. Sanders;1987.p.1326-49.
 5. G Sr. Excision of cancer of the head and neck with special reference to the plan of dissection based on 132 patients. JAMA 1906;47:1786.
 6. Blair VP, Brown JB. The treatment of the cancerous or potentially cancerous lymph nodes. Ann Surg 1933; 98:650.
 7. Martin HE. Neck dissection. Cancer 1951;4:441-9.
 8. Jesse RH, Barkely HT Jr., Lindberg RD, Fletcher GH. Cancer of the oral cavity. Is elective neck dissection beneficial? Am J Surg 1970;120:505.
 9. Jesse RH, Ballantyne AJ, Larson D. Radical or modified neck dissection: A therapeutic dilemma. Am Surg 1987; 136: 516-9.
 10. Medina JE, Byers RM. Suparomohyoid neck dissection: rationale, indications and surgical technique. Head Neck Surg 1989; 111- 222.
 11. Medina JE, Rigual NM. Neck dissection. In: Cummings CW, Fredrickson JM, Harker LA, Krause CJ, Schuller DE, editors. Otolaryngology – Head and neck surgery. 2nd ed. Philadelphia (USA): Mosby year book;1993.p.1664.
 12. Fish UP, Sigel ME. Cervical lymphatic system as visualized by lymphography. Ann Otol Rhinol Laryngol 1964; 73: 869-82.
 13. Skolnik EM. The posterior triangle in radical neck surgery. Arch Otol 1976; 102: 1-4.
 14. Bocca E, Pignataro O. A conservation technique in radical neck dissection. Ann Otol Rhinol Laryngol 1967; 76: 975.
 15. Bocca E, Pignataro O, Sasaki CT. Functional neck dissection. A description of operative technique. Arch Otolaryngol 1980; 106: 524.
 16. Remmier D, Byers R, Schertz J, Shell B, White G, Zimmerman S, et al. A prospective study of shoulder disability resulting from radical and modified neck dissection. Head Neck Surg 1986; 8:280-6.
 17. Sobol S, Jensen C, Sawyer W, Costiloe P, Thong N. Objective comparison of physical dysfunction after neck dissection. Am J Surg 1985; 150: 503- 9
 18. Leipzig B, Suen JY, English JL, Barnes J, Hooper M. functional evaluation of the spinal accessory nerve after neck dissection, Am J Surg 1983; 146(4): 526-30.
 19. Byers RM. Modified neck dissection: a study of 967 cases from 1970 to 1980. Am J Surg 1985; 150(4):414-21.
 20. Hirata RM, Jaques DA, Chambers RG, Tuttle JR, Mahoney WD. Carcinoma of oral cavity, an analysis of 478 cases. Ann Surg 1975; 182(2): 98-51.
 21. Bocca E, Pignatar O, Oldinic C, Cappa C. Functional neck dissection: an evaluation and review of 843 cases. Laryngoscope 1984;94:942-6.
 22. Caumano RJ, Persky MS. Squamous cell carcinoma of the oral cavity. Head Neck Surg 1988; 10:229.

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