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# A STUDY OF THE ROLE OF ELECTIVE NECK DISSECTION IN CLINICALY $N_0$ NECK IN HEAD AND NECK CANCER

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## ABSTRACT

**Introduction:-** Head and neck cancers are the 6th most common cancer worldwide. The majority being squamous cell carcinomas, with lip and oral cavity cancer being the 2nd most common in India. Lymphatic metastasis, specially Cervical lymph node metastasis is one of the most critical prognostic factors. The low sensitivity of clinical assessment via palpation and the consequent risk of missing subclinical metastasis, is the source of one of the greatest controversies in the history of head and neck oncology: whether or not to electively treat the clinically node negative (N0) neck in head and neck carcinomas. Therefore careful clearance of cervical lymph nodes is the crucial part of treatment. It has been proved that elective neck dissection has better results than therapeutic neck dissection after recurrence in clinically N0 neck. So this prospective study was planned to evaluate the role of elective neck dissection in patients of oral squamous cell carcinoma with node negative neck.

**Material and methods:-** This study was conducted in the department of Otorhinolaryngology and Head and Neck surgery, RNT medical College and MB hospital, Udaipur. from feb.2018 to dec.2018. We conducted a Hospital based prospective study of 50 cases of all age groups and both sexes having head and neck cancers.

A detailed relevant history was taken, followed by a thorough general physical and Otorhinolaryngological examination. Complete assessment of size, site and extent of tumor was done to properly stage the tumor. A biopsy was taken from the primary site in every patients for histopathological evaluation. The data were collected and analysed with suitable statistical tools using SPSS statistical software.

**Results:-** Our study results in that high occult metastasis rate may justify the preference of elective treatment of the neck in a patient over a 'wait-and-watch' policy despite the associated morbidities. However, this decision needs to be tailored to every case, and should be tackled via a multidisciplinary approach.

## KEYWORDS

Head and neck cancers, Squamous cell carcinomas, Lymphatic metastasis, Elective neck dissection.

## INTRODUCTION:

Head and neck cancers are the 6th most common cancer worldwide. The majority being squamous cell carcinomas, with lip and oral cavity cancer being the 2nd most common in India. The overall incidence of cancers in India over a period ranging from 2016 to 2018 ranges from 43.7 to 273.4 per lakh population in males and 51.6 to 227.8 per lakh in females. The spread of these tumors is governed by a number of variables, with lymphatic metastasis being reported as the most important mechanism of spread.[1] Keeping this in mind, cervical lymph node metastasis is one of the most critical prognostic factors for staging head and neck tumors and deciding upon a particular management strategy.[2]

Diagnosis of cervical lymph node metastasis may be effectuated via clinical assessment, various radiological diagnostic modalities, sentinel node biopsy, and, finally, histopathological examination of the neck dissection specimen, considered to be the gold standard.[3] Of all the methods for the detection of lymphatic metastasis and staging the neck, clinical assessment via palpation is the most widely practised. However, both the sensitivity and the specificity for detection of nodal metastasis are low.[4,5] The low sensitivity of this method, and the consequent risk of missing subclinical metastasis, is the source of one of the greatest controversies in the history of head and neck oncology: whether or not to electively treat the clinically node negative ($N_0$) neck in head and neck squamous cell carcinomas. The treatment options available are elective neck irradiation, elective neck dissection, and a 'wait and watch' policy, where the oncosurgeons keep the patient under regular close observation with a therapeutic neck dissection once nodal metastasis becomes obvious.[3]

In addition, the availability of these multiple treatment options, along with the difficulty in defining an "acceptable" risk to provide elective treatment, makes the management of the neck in a clinically $N_0$ neck in head and neck squamous cell carcinomas highly controversial.

It is, thus, evident that there is a great need for improvement in the assessment of neck node metastases, particularly for a clinically No neck where such great controversy exists regarding its elective management, with very little prospective evidence available comparing the methods of assessment of the neck, as well as regarding the management of a clinically $N_0$ neck.

Oral squamous cell carcinoma is the most prevalent of all malignancies arising from the oral cavity and could result in severe morbidities and mortality if not promptly identified and treated. It accounted for 30% of all head and neck cancers.[4] The most significant prognostic factor in the treatment of patients with oral squamous cell carcinoma is the cervical lymph node status.[6] The treatment of cervical lymph nodes in head and neck squamous cell carcinoma is largely based on the lymphatic drainage of the upper aero-digestive tract.[7] The rich lymphatic drainage in this region makes these tumors to show a high incidence of metastasis to regional cervical lymph nodes.[8] Even a single lymph node metastasis may diminish survival approximately by 50%.[9]

Therefore careful clearance of cervical lymph nodes is the crucial part of treatment in these patients. It has been proved that elective neck dissection has better results than therapeutic neck dissection after recurrence in clinically N0 neck.[10]

Selective neck dissection, whether supraomohyoid (level—I–III) or extended supraomohyoid (I–IV) is the surgery of choice to address the neck in clinically node negative neck in oral squamous cell carcinoma.[11] Selective neck dissections are also associated with some morbidities. One of them is postoperative shoulder syndrome. Despite preservation of the spinal accessory nerve there may be some injury to the nerve, resulting from traction and elevation during removal of level IIB lymph nodes group.[12,13]

Currently, management of the clinically negative (cN0) neck in patients whose tumor can be resected transorally remains controversial.[14] In general an elective neck dissection (END) is justified if the estimated risk of occult lymph node metastases exceeds 15-20%.[15]

The indication of neck dissection in oral squamous cell carcinoma (OSCC) is a problem of risk-benefit evaluation between probability of neck metastases, the problem of complications associated with neck dissection and the prognostic influence of delayed diagnosis of metastasis during follow-up.[16] Although END results in early

treatment of occult lymph node metastases, the vast majority of these neck dissections harbors no metastases and was unnecessary.[17] Moreover, these patients are subjected to morbidity such as shoulder morbidity, pain and sensibility disorders, which may have major impact on health-related quality of life.[18] Furthermore, neck dissection may remove a barrier to cancer spread in case of local recurrence or second primary tumor.[19] There is no consensus on the elective treatment of the neck in early oral cancer patients with a cN0 neck.[20]

So this prospective study was planned to evaluate the role of elective neck dissection in in patients of oral squamous cell carcinoma with node negative neck.

## MATERIALS AND METHODS:

**Study Area:** This study was conducted in the department of Otorhinolaryngology and Head and Neck surgery, RNT medical College and MB hospital, Udaipur. from feb.2018 to dec.2018. with Due permission from institutional ethical committee was obtained.

**Study Design:** Hospital based prospective study

**Sample Size:** Patients of head and neck cancers attending the outpatients department of Otorhinolaryngology. A total 50 patients of all age group and both sexes were selected in the study.

**Inclusion criteria:** Patients included are cases of histologically proven head and neck cancer with a clinically $N^0$ neck and the primary tumor requiring surgery as the primary modality of treatment.

**Exclusion criteria:**

Patients were excluded from the study if they had:

1. Any clinically palpable cervical lymph nodes.
2. Evidence of distant metastasis.
3. History of irradiation of head and neck.
4. Undergone surgery for head and neck malignancy.
5. Pregnant

A detailed relevant history was taken, followed by a thorough general physical and Otorhinolaryngological examination. Complete assessment of size, site and extent of tumor was done to properly stage the tumor. A biopsy was taken from the primary site in every patients for histopathological evaluation and treatment would planned according to the stage.

After routine clinical assessment, patients were made to undergo contrast enhanced computed tomography. Criteria for considering a node positive on contrast enhanced computed tomography scanning were:

- Size greater than 1 cm
- Rim enhancement

following intravenous contrast

- Central necrosis
- Spherical shape
- Three or more lymph nodes in the first drainage area
- Extracapsular spread

Considering these criteria, any node detected as metastatic on computed tomography were documented according to the location, number, size, internal architecture and relation to surrounding structures. All the images of computed tomography were assessed by a radiologist without prior knowledge of the clinical status of the patient. All patients under study underwent elective neck dissection along with surgical excision of primary tumor.

**Statistical analysis:**

The data were analysed with suitable statistical tools using SPSS statistical software. Results of clinical examination and computed tomography were analyzed vis-a-vis histopathological results of neck dissection specimens with respect to sensitivity, specificity, positive predictive value, negative predictive value, and accuracy.

## RESULT:

On clinical assessment, all 50 cases showed no nodal metastasis. In 38 of these 50 cases, the histopathological evidence of absence of nodal metastasis corroborated with that of clinical examination. In 24% of cases, the patients were upstaged from a clinically $N_0$ to a histopathologically $N^+$ neck with evidence of microscopic metastases. The negative predictive value of clinical examination, thus, was 76%.

**Table: 1 Clinical Examination vis-a-vis Histopathology**

| | |
|---|---|
| **Clinically N0** | **50** |
| **Histopathologically N+** | 12 |
| **True Negative** | 38 |
| **False Negative** | 12 |
| **Negative Predictive value (%)** | 76 |

**Table: 2 Complications**

| Complications | No. | % |
|---|---|---|
| Intraoperative haemorrhage | 2 | 4% |
| Post operative haemorrhage | 1 | 2% |
| Wound infection | 1 | 2% |
| Wound dehiscence | 2 | 4% |
| Chylous leak | 2 | 4% |
| Marginal mandibular nerve injury | 1 | 2% |
| Spinal access nerve injury | 2 | 4% |
| Total | 11 | 22% |

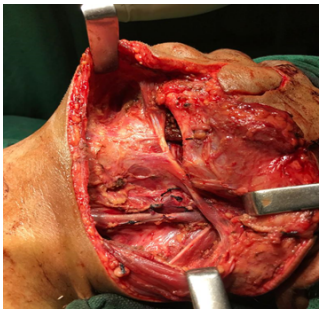
**Follow up:**

Out of the 50 cases that were selected, 90% followed up at 3 months after surgery, 78% followed up at 6 months post-surgery, and 56% followed up after 1 year. In the follow up period, a total of 4 cases presented with recurrence in the neck (3 ipsilateral and 1 contralateral). In addition, none of the patients experienced any discomfort or pain in the shoulder, or any restriction of shoulder movement after neck dissection.

**Table: 3 Follow-Up**

| Follow Up | No Recurrence | Recurrence | Lost to Follow up |
|---|---|---|---|
| 3 months | 45 | 1 | 4 |
| 6 months | 39 | 2 | 9 |
| 1 year | 28 | 4 | 18 |

**Picture: 1 Neck Post Supraomohyoid Neck Dissection**



## DISCUSSION:

Squamous cell carcinoma is the most commonly encountered malignant neoplasm in the upper aero digestive tract, accounting for more than 90% of reported oral cancer. It is the sixth most commonly reported cancer worldwide. Men are affected twice as often as women and most patients are older than 45 years of age.

The most common site seen in our study was the buccal mucosa in 40% of cases, followed by tongue in 32% cases, lower alveolus in 14%, larynx in 12% and lip in 2% cases. Worldwide, carcinoma larynx has been reported as the most common site for head and neck cancer.[21] However, in India, oral cavity cancers account for majority of head and neck cancers, a finding that was replicated in our study as well.[21]

Present study included 50 cases of $N_0$ head and neck cancers attending the outpatient department of Otorhinolaryngology and were subsequently admitted to the Otorhinolaryngology Ward. In our study, all cases were subjected to excision of the primary tumor along with an elective neck dissection. Of these, 21 underwent a Supraomohyoid Neck Dissection (removal of lymph node levels I, II, III), 7 underwent an Extended Supraomohyoid Neck Dissection (Removal of level IV in addition to levels I, II, III), 6 underwent a Lateral Neck Dissection (Removal of lymph node levels II, III, IV) and 16 patient underwent a Modified Radical Neck Dissection (Removal of lymph node levels I-V). **(Picture: 1)**

An occult metastasis rate of 25% was detected in $N_0$ buccal mucosa

cancers, as evidenced by histopathology. All detected occult metastases were on the ipsilateral side of the neck.

For oral cavity cancers, these findings were in concordance with the guideline for elective neck dissection proposed by Weiss et al, who proposed that at a threshold occult metastatic rate of 20% the morbidity caused by elective treatment is offset by its benefit.[22] This has also been supported by the Scottish Intercollegiate Guideline Network in their latest guidelines for the diagnosis and management of head and neck cancers.[23]

Ferlito et al, in 2006, reported that a number of surgeons would prefer to treat a neck electively at a much lower probability of occult nodal metastasis (5-15%), which supported our findings for laryngeal primaries.[24]

Our rationale for selective neck dissection in all cases was supported by Clayman et al and the Brazilian Head and Neck Cancer study group, both having reported selective neck dissection to be therapeutically equivalent to a comprehensive neck dissection in the No neck.[25,26]

A negative predictive value of 76% for clinical examination was in tune with that of 77% reported by Merritt et al in 2017, 74% reported by Haberal et al in 2014, and 84.1% reported by Rottey et al in 2006, and a little higher than that of 62.3% reported by Anand et al in 2007.[27-30] **(Table: 1)**

D'Cruz et al[14] (2015) conducted a prospective study on elective versus therapeutic neck dissection in node-negative oral cancer. There were 81 recurrences and 50 deaths in the elective-surgery group and 146 recurrences and 79 deaths in the therapeutic-surgery group. At 3 years, elective node dissection resulted in an improved rate of overall survival (80.0%; 95% confidence interval [CI], 74.1 to 85.8), as compared with therapeutic dissection (67.5%; 95% CI, 61.0 to 73.9), for a hazard ratio for death of 0.64 in the elective-surgery group (95% CI, 0.45 to 0.92; P=0.01 by the log-rank test). At that time, patients in the elective-surgery group also had a higher rate of disease-free survival than those in the therapeutic-surgery group (69.5% vs. 45.9%, P<0.001). Elective node dissection was superior in most subgroups without significant interactions. Rates of adverse events were 6.6% and 3.6% in the elective-surgery group and the therapeutic-surgery group, respectively. Among patients with early-stage oral squamous-cell cancer, elective neck dissection resulted in higher rates of overall and disease-free survival than did therapeutic neck dissection.[10]

Neck dissection stays as an important step in eradicating the regional lymph node metastasis in head and neck cancers. Although neck dissection is a technically well-established procedure, complications still occur. Intra-operative events, such as hemorrhage, loss of a venous suture resulting in air embolism, chylous leakage due to thoracic duct injury[41], and arrhythmia because of carotid bulb manipulation, are habitually promptly managed; these events may, however, be disastrous for the patient. Careful dissection and ligature of vessels are extremely important to avoid intra and postoperative hemorrhage. Hematomas are avoided by careful hemostasis and continuous suction drainage.[31] Nerve injuries are the most common complications that we came across in our study. One patients with marginal mandibular nerve injury was managed conservatively and among 2 patients with spinal accessory nerve injury, neuropraxia noted in both cases which were recovered gradually. **(Table: 2)**

A study done by Prim et al, concluded that nerve injury during neck dissection is not uncommon; it may result in loss of function or pain syndromes. The incidence is low after functional ND (in a 442-patient series): accessory nerve injury -1.68%; marginal mandibular nerve injury -1.26%; hypoglossal nerve injury -0.56%; and sympathetic cervical nerve injury -0.42%.[32]

## CONCLUSION:

Nodal metastases are known to be one of the most important prognostic factors for staging of head and neck cancers as well as deciding upon a management strategy. Head and neck cancers with a clinically $N_0$ neck are seen to have a high occult cervical metastasis rate, highest in oral cavity cancers, and failure to control this neck disease may lead to a fatal outcome. This high occult metastasis rate may justify the preference of elective treatment of the neck in a patient over a 'wait-and-watch' policy despite the associated morbidities. However, this decision needs to be tailored to every case, and should be tackled via a multidisciplinary approach with the involvement of head and neck surgeons, medical oncologists and reconstructive surgeons.

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