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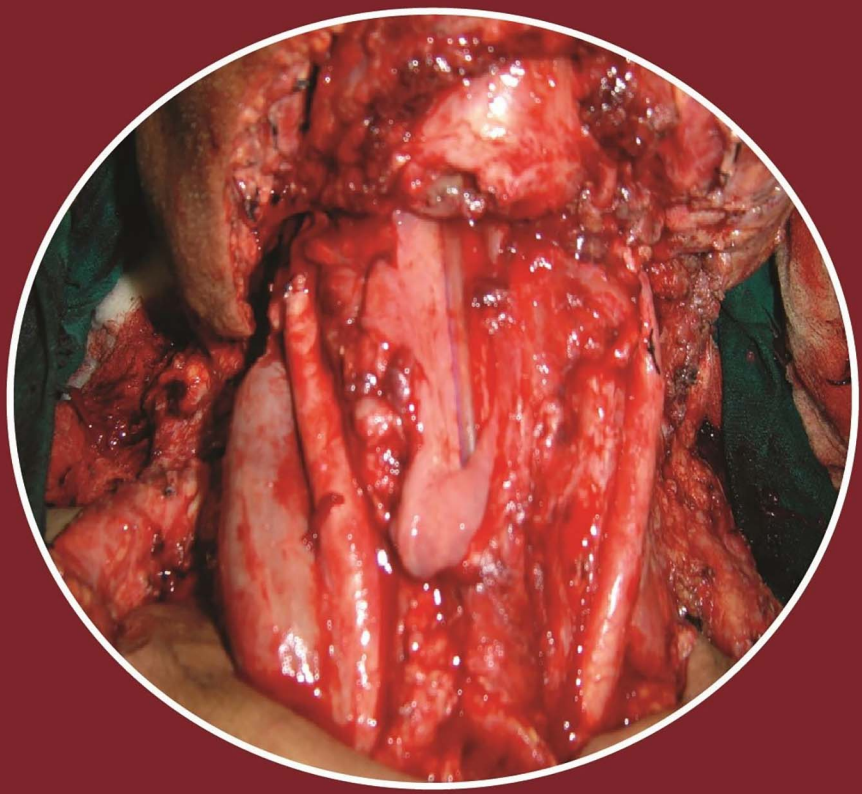
Neck Dissections



Chintamani

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JAYPEE GOLD STANDARD® MINI ATLAS SERIES

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MANAGEMENT OF NODE NEGATIVE (N0) NECK

- For obvious neck metastases, the standard of care is comprehensive or radical neck dissection but with a recent and growing trend towards preservation of form and function in cancers, conservative neck dissections have gained popularity.
- Growing historical evidence also suggests that modified and selective neck dissections offer disease control comparable to radical neck dissections and with significantly less morbidity. There has been a rapid and significant development in investigations to detect the neck nodes that are metastatic in order to avoid diagnostic neck dissections.[1-5]
- Having mentioned that the gold standard for the presence of neck metastases continues to be the histological evidence of disease, which can be known only after neck dissections.

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THE CONTROVERSIES !![1-6]

- The incidence of occult metastases in the neck in patients (of head and neck cancers) with N0 neck has been found to be around 20-40 percent, i.e. these patients harbor occult disease in their necks but have no detectable nodes.
- It is well known that management of these patients after their conversion to N1 or N2 subsequently is more difficult and not as rewarding.
- It is, therefore, therapeutically tempting to treat neck in these patients on the basis that this would avoid subsequent treatment modalities, which may not be as effective.
- But what this would also mean is that 60–80 percent of patients are likely to be "overtreated".

EVALUATION OF PATIENTS WITH N0 NECK STATUS[1,6-9]

- Staging the neck is very challenging and no one method is sensitive enough in isolation and one would therefore require combined investigation modalities to accurately stage the neck.
- Clinical examination is subjective and influenced by the skill of the examiner, the patient's body habitus and whether the patient has had previous surgical or irradiation therapy. As a result of these factors, the false negative rates in clinical assessment range from 20–51 percent.[1,6-9]

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- Imaging techniques like computed tomography (CT scanning), magnetic resonance imaging (MRI) and ultrasound have also been used for evaluation. CT scan has a sensitivity of 81 percent. Size and central lucency of nodes have been used as criteria for identifying nodes containing metastatic tumor but the specificity is low. Routine scanning of the neck in a patient with a head and neck primary tumor is not justifiable at present.
- The sensitivity of ultrasound examination can be improved (to 89%) by adding ultrasound guided fine needle aspiration cytology (USFNA) but ultrasound examination is operator dependent.
- Thus, as of now no pre-treatment study alone can accurately assess or replace the requirement to stage the neck histopathologically making neck dissections in these cases necessary and the goal of identifying 'sub-clinical disease' without surgical intervention remains elusive.

TREATMENT OPTIONS FOR N0 NECK[5,6]

Expectant Management

- In the N0 neck, no prospective studies demonstrate survival differences between surgical, radiation, and expectant management
- However, the prognosis after the development of subsequent cervical metastasis is poor and most clinicians agree that if the primary lesion poses more than a 20 percent likelihood of metastasis, either surgery or radiation therapy is beneficial at the time of primary treatment.

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Radiation Therapy

- It is accepted that radiation therapy in the N0 neck will reduce the conversion rate (to N1 or N2) of that neck to about 5 percent.[1-4]
- The node positive neck is more effectively treated with a combination of surgery and radiation.

Surgery

Elective neck dissections

Arguments for Elective Neck Dissections

1. High incidence of occult metastatic disease.
2. Limited neck dissection has a low morbidity and mortality.
3. If the neck has to be entered to remove the primary lesion, it is better to perform in continuity lymph node dissection at that time.
4. It is impossible to provide the clinical follow-up necessary to detect the earliest conversion of the neck from N0 to N1.
5. Allowing neck metastases to develop, increases the incidence of distant metastases.

Arguments against Elective Neck Dissections

1. Cure rates are not lower if the surgeon waits for the neck to convert from N0 to N1.
2. Careful clinical follow up will allow detection at the earliest conversion from N0 to N1.

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3. Radiation is as effective as neck dissection for non-palpable disease.
4. Elective neck dissection results in a large number of unnecessary surgical procedures associated with inevitable morbidity.
5. Elective neck dissection removes the barrier to the spread of disease and may have a detrimental immunological effect !!.

Recommendations for Surgical Management of N0 Neck in Head and Neck Cancers[1-6,9]

- Radical neck dissections are not recommended for an N0 neck and function preserving MRND or SND are mostly employed for an N0 neck.
- As mentioned earlier the recurrence and failure rates for RND and SND are comparable in most studies.
- It is however technically easier to perform RND rather than functional or selective neck dissections. Therefore surgeons performing occasional neck dissections should err on the side of more radical neck dissections in view of the oncological safety which is paramount in the management of neck in head and neck cancers.
- There is however a need to tailor the procedure and the decision regarding the type of neck dissection in any particular case would depend on the site of primary tumor, other tumor factors (e.g. location, depth, size, differentiation, vascular or perineural invasion), the patient and the surgeon undertaking the procedure.

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- Tumors of the tongue, floor of mouth, nasopharynx, oropharynx, hypopharynx and supraglotic larynx have a high incidence of nodal metastases. In contrast, tumors of the buccal mucosa, lip, paranasal sinuses and glottic larynx metastasize less frequently.
- For a patient who stays some distance from the surgical centre and who is not expected to come for regular follow-up (and for unreliable patients) an END (elective neck dissection) would be a better option.
- The controversy regarding the impact of differences in the regional control rates or survival between patients undergoing END for N0 disease or therapeutic neck dissection for N1 disease remains controversial. Some authors claim no difference while other studies have shown that END significantly improved regional control of the disease.
- It is however not necessary that all patients would present later with N1 disease only, they may present with N2 or rarely even N3 disease, particularly in developing or underdeveloped countries. Hence END must always be considered based on the primary tumor characteristics as prognosis depends on the extent of metastatic neck nodal disease.
- An END accurately stages the disease pathologically, detects and treats micro-metastases, thus controlling regional disease and helping in the planning of adjuvant therapy.

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Neck Dissections

Terminology and the Confusion

- Like in tongue cancers where level IV nodes are also removed along with supraomohyoid neck dissection (SOHND), terminologies like extended SOHND have been used which may be confusing.
- This adds to the complexity of the classification and it would only make it easier if the surgeon just mentions the levels removed along with SND.
- Hence, it is recommended to use the nodal levels or sublevels which are dissected instead of the named SND. Like a classical SOHND would be **SND –I, II, III** and extended SOHND should rather be described as **SND-I, II, III, IV.**

Radiation Therapy in N0 Necks[1-6]

- Elective nodal irradiations (ENI) in doses of 40 to 50 Gy have been found to control occult metastases in 90 to 95 percent of cases.
- Although prospective evidence is lacking, retros-pective data suggest that for most sites and for early lesions, elective nodal irradiation (ENI) and END offers equivalent local control.
- Proponents of ENI assert that the morbidity is low with limited soft tissue changes and does not have systemic ramifications.
- However, considerable acute adverse effects such as mucositis and xerostomia, together with late effects like endarteritis, radionecrosis etc .can occur. Systemic effects

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include suppression of humoral and cell mediated immunity.

The Summary of Recommendations[1-6, 8,9]

- While choosing between elective neck dissections and elective nodal irradiation the issue is to pick-up the modality that is **less harmful rather than one that is more beneficial.**
- Therefore various factors like the patient's age, general health, family support, reliability and patient's own wishes are important.
- It is not easy to compare elective neck dissection and elective nodal irradiation efficacy because the status of neck disease is unknown when elective irradiation is used.
- The accurate histological information on micrometastases in neck nodes in patients with clinically negative neck nodes is probably one of the prime factors that tilts the argument towards nodal dissection, apart from the lesser associated morbidity.
- If the resection of the primary involves entering in to the neck , END would appear to be an obvious choice as there would be minimal, if any additional morbidity.
- If the primary tumor is being treated with irradiation, an elective irradiation of nodal area should be planned.
- It is also recommended that END be performed when the expected incidence of microscopic or subclinical disease exceeds 20 percent. ***The National Cancer Comprehensive Network's adopted practice guidelines recommend END***

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for cancers of the oral cavity, oropharynx, hypopharynx and supraglottic larynx when the nodal status is N0.

- Tumors of the nasopharynx are primarily treated with radiotherapy, which includes nodal management. Surgery plays a limited role to salvage residual neck disease following failure of primary radiotherapy.
- For oral tumors, the high incidence of occult nodal metastases, and notoriously poor salvage rates, make expectant treatment ill-advised in most cases. Similarly the lower alveolar ridge carcinomas have a low potential for neck metastases. With the exception of this, treatment of subclinical neck disease is indicated for all oral cavity lesions.
- It is also important to note that carcinomas of the oral cavity rarely spread to lower jugular or posterior cervical nodes in the absence of involvement of level I-III. An elective SND (levels I-III) provides staging information and may be the only therapy necessary for occult disease. It has minimal morbidity and it reduces the risk of occult disease evolving into clinically evident metastases. In addition, the undesirable effects of radiotherapy are avoided.
- A tongue tumor with a depth of invasion of more than 4 mm is likely to produce occult nodal metastases.
- As a sub-site of oral tumors, the tongue is notorious for nodal metastases. For a well differentiated T1 tumor, with less than 4 mm of muscle invasion and a clinical N0 status in the neck, a model predicts a 14% chance of nodal metastases.

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Management of the Neck Nodes

- Sub-digastric and mid jugular are the most frequently involved nodal groups in primary oral cavity tumors. Evidence also indicates that level IV nodes may also be at risk in a tongue primary cancer. An ipsilateral SND (levels I-IV) is indicated for tongue primaries. Both sides of the neck have to be addressed in midline, or near the midline, tongue primaries.
- In tumors of the oropharynx, the risk of occult nodal metastases is 30-35 percent. There is a high incidence of level II, III and IV involvement. In addition, there is an increased risk of bilateral occult nodal disease in tumors near the midline and treatment should include both sides of the neck.
- Tumors of the hypopharynx are known for extensive sub-mucosal spread. The retropharyngeal and paratracheal nodes are also at risk of harboring metastases. Occult nodal metastases are present in approximately 30-55 percent of patients with primary hypopharyngeal tumors and occur frequently in the contralateral side of the neck.
- Larger tumors (T3 or greater) usually require combined therapy. In cases where surgery is chosen to treat an advanced primary cancer, a bilateral neck dissection aiming at removal of all the nodes at risk is performed. If combined therapy is planned, a unilateral neck dissection is undertaken and irradiation may be used to treat the un-dissected neck.
- In tumors of the supraglottic larynx, the location of the tumor has a prognostic significance. Marginal lesions like

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those on aryepiglottic fold and suprahyoid margin of the epiglottis behave more aggressively with an increased risk of nodal metastases. There is also a high-risk of contralateral nodal metastasis for lateral (aryepiglottic fold) as well as midline (epiglottic) lesions. This makes bilateral neck dissections a necessity when electively performed.

- Carcinoma of the supraglottic larynx has a high incidence of occult metastases in the range of around 30 percent. Based on current evidence, if surgery is planned for primary therapy, SND of levels II through IV is acceptable. Dissections need to be bilateral to prevent contralateral neck failure and recurrence of disease. If irradiation is planned, the contralateral side of the neck may be irradiated.
- In contrast, glottic cancers remain localized due to sparse lymphatics. T1 and T2 carcinomas have less than 7 percent nodal metastases. If such patients are available for regular follow-up, these patients may be closely observed. But, recurrent cancers have a significantly higher occult metastases rate reaching 20-22 percent. An END incorporating levels II through IV may be planned.
- T3 and T4 glottic carcinomas have occult nodal metastasis in the range of 20-40 percent. In addition, salvage rates for recurrences are dismal. Hence, T3 and T4 glottic carcinomas should receive ipsilateral SND of levels II through IV and level VI.

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- The reported incidence of subglottic tumors is low. These have a high incidence of extralaryngeal spread due to the proximity of the cricothryoid membrane and the rich post-cricoid lymphatics. They drain to pre- and para-tracheal, pre-laryngeal and superior mediastinal nodes. The sparse data makes conclusive recommendations difficult. However, a wide field laryngectomy, bilateral para-tracheal dissection, pre-laryngeal nodal dissection with an ipsilateral hemithyroidectomy should be planned with postoperative radiation to stoma, mediastinum and both sides of neck.

OPTIMUM NUMBER OF NODES IN SND

- A SND should include at least 6 nodes on pathological examination. If nodes appear involved near the lower end of the dissection, the SND should be converted to a formal MRND. Alternatively, if facilities are available, frozen section can be employed.
- SND is traditionally looked upon as a diagnostic or staging procedure. Increasing evidence indicates that the procedure could definitely be therapeutic, at least in N0 and early N+ disease, with results comparable to RND.
- The therapeutic efficacy of SND is not diminished in the presence of occult nodal disease.
- However, there is evidence indicating that recurrence rates are higher if post-operative irradiation is not used when one or more nodes are pathologically positive after SND.

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