Main Article

Complications of Neck dissection : Our Initial Experience

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ABSTRACT

Introduction

Neck dissection is an important surgical procedure to treat head-neck cancers. It also helps to stage the disease as well as denotes further treatment plan.

Materials and Methods

A retrospective analytical study is done between August 2017-July 2021 in tertiary care hospital to identify methods and practices to reduce complications of neck dissection. 104 patients who met the selection criteria were reviewed. Any intraoperative as well as post-operative complication was carefully assessed and managed as per protocol.

Results

62.5% were in the age group of 49-59 years. 66.35% were male. Maximum patients (65.38%) presented with oral cavity squamous cell carcinoma. 51.92% had N1 neck node while 44.23% had N0 neck node. Internal jugular vein injury, spinal accessory nerve and marginal mandibular nerve injury, post-operative hematoma, seroma formation, chyle leak were found as significant complications in initial days. They were either less in number or managed well with experience.

Conclusion

Detailed knowledge of head-neck anatomy, meticulous dissection technique, early detection of any complication and its management can decrease the long-term morbidity and improve patient's quality of life.

Keywords

Neck Dissection; Head-Neck Cancer; Complication; Meticulous Haemostasis

Neck dissection is a surgical procedure for the diagnosis and treatment of head neck cancers. The procedure consists of removal of lymphatic nodes from the neck with or without the removal of the sternocleidomastoid muscle, the internal jugular vein and the spinal accessory nerve. Removal of the lymph nodes from the neck not only aids in staging the disease but also accomplishes the task of treating lymph node disease and provides a statement for the required adjuvant therapy. Because of the intricate anatomy of the human neck, some risks and complications accompany this procedure. Thus, it is much needed for the surgeon to study the complications of neck dissection and get an insight into the methods that might reduce the occurrence of such complications.

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Sir Crile introduced radical neck dissection in the 20th century which was later popularized by Hays Martin.[1, 2] Since then, many changes have been proposed for a more conservative approach to neck dissection but not at the cost of non-eradication of lymph node disease. The gradual shifting of Radical to Selective neck dissection made life easy for the surgeons in terms of fewer complications and less morbidity while being in complete compliance with the oncologic principles. The number of neck recurrences are lower for functional neck dissection in elective neck dissections.[3] While some school of thoughts has promoted chemotherapy as an alternative approach to primary surgery,[4] evidence-based literature has put neck dissection one step ahead of chemotherapy

considering many vital parameters and prognostic factors.

The purpose of our study is to establish the various complications associated withneck dissection and to develop the practices that help in reducing these intra-op and post-op complications.

Materials and methods

We conducted a retrospective analytical study on IPD of a tertiary care hospital between August 2017 to July 2021 (4 years). Patients of all age group of different sex were included. 104 patients who presented with head and neck carcinoma were chosen. All of them needed resection of primary with neck dissection. Patients who received prior neck irradiation, having nodal recurrence and unfit for surgery were excluded from the study.

Results

All the patients were categorized according to their primary site of carcinoma. The patients having clinically N0 neck node were investigated by high resolution USG, while those having clinically positive neck nodes were assessed by CECT neck. CT-angiography were done in those cases suspected to have great vessel involvement. The patients underwent neck dissection, the extent of which again depended on the primary site and the levels of lymph nodes involved. Any complication encountered intra-operatively or post-operatively was carefully assessed and managed as per protocol. All the patients were followed up methodically. The data collected were analysed and represented using tables and charts.

1. Distribution of patients according to age: Maximum patients 65 (62.50%) were in the age group 40-59years.The age of 5 patients were <20years. Twenty two (22) patients were between 20-39years of age and the age of 12 patients were >60years.
2. Distribution of patients according to sex: Sixty nine (69) patients (66.35%) were male and 35 (33.65%) were female. Male predominance probably linked with the lifestyle issues and addiction habits.
3. Distribution according to the primary site of carcinoma: In this study, maximum patients (65.38%) presented with oral cavity squamous cell carcinoma, followed by thyroid malignancy (23.08%).

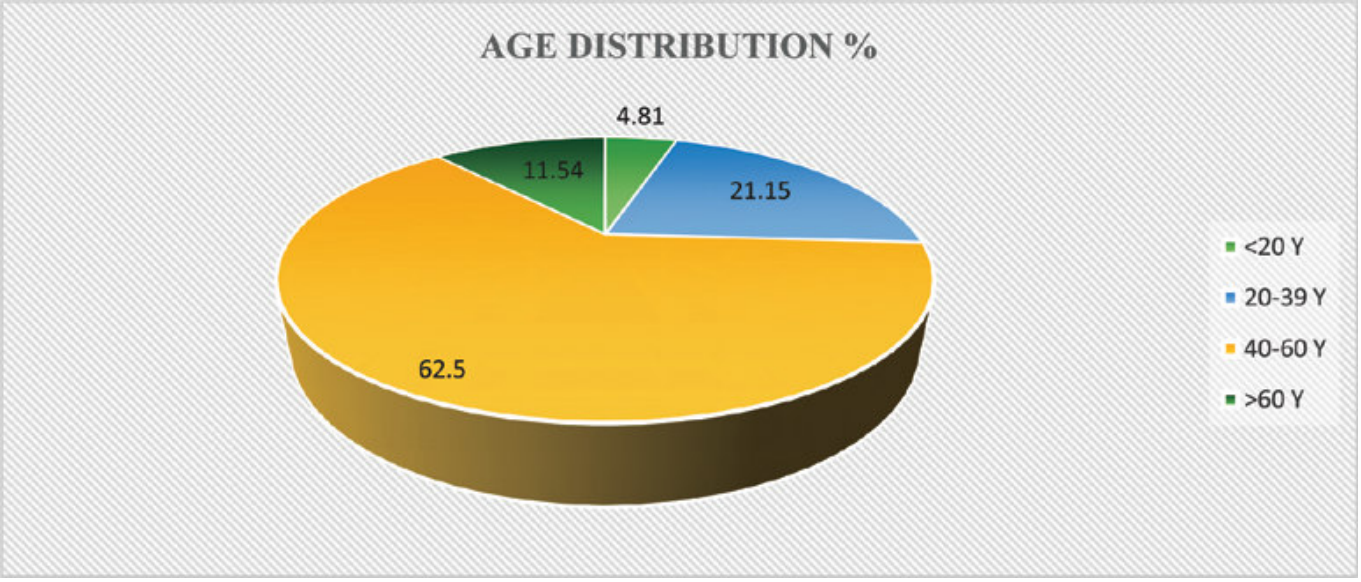

Fig. 1. Age Distribution

Table I : Distribution of patients according to primary site

PRIMARY SITE	NUMBER OF PATIENTS	PERCENTAGE
Oral cavity	68	65.38
Thyroid	24	23.08
Parotid	5	4.81
Submandibular gland	3	2.88
Larynx	4	3.85

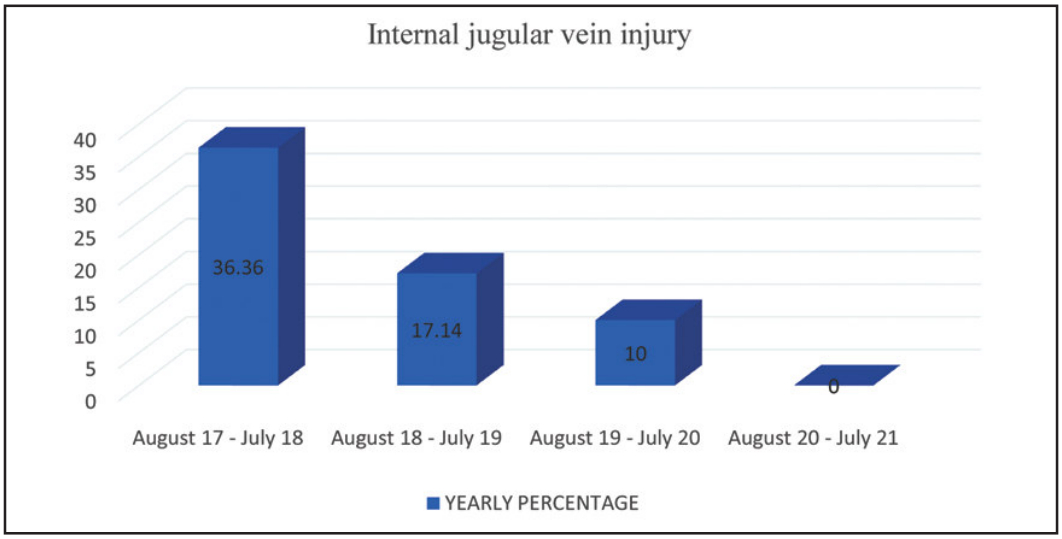

Fig. 2. Yearly percentage of internal jugular vein injury

4. Distribution according to neck nodal status of patient: Oral cavity carcinoma (n = 68) have 46 cases with N0,18 cases with N1,4 cases with N2.Thyroid malignancy (n =24), Parotid Ca (n = 5), submandibular malignancy (n = 3), laryngealmalignancy (n = 4): all were N1.

   N0 = 46 cases; N1 = 54 cases; N2 = 4 cases.

5. Distribution of cases according to the year of operation: We operated 22 (21.15%)patients from August 2017 to July 2018, 35 (33.65%) patients from August 2018 to July 2019, 30 (28.85%) patients from August 2019 to July 2020 and 17 (16.35%) patients from August 2020 to July 2021.

6. Injury to internal jugular vein (IJV) over the years: Eight patients betweenAugust 2017 - July 2018, six patients between August 2018 - July 2019, three patients between August 2019 - July 2020 and none between August 2020 - July 2021 had injury to IJV during neck dissection. Trans-fixation suturing (with 4-0 Prolene suture) was done in all IJV injury cases to achieve meticulous haemostasis. IJV rent occurred maximum during the initial period under evaluation, which gradually decreased over time. We preferred to do lateral to medial dissection. We also practiced dissection with scalpel towards the end rather than using monopolar cautery.

7. Marginal mandibular nerve injury:7 patients in August 2017 - July 2018, 6 patients in August 2018 - July

Fig. 3. Marginal mandibular nerve

Fig. 4. Recovery of marginal palsy, immediate post op mandibular nerve palsy.

Fig. 5. Post-op seroma

Fig. 6. Seroma resolved after aspiration

2019, 3 patients each in August 2019 - July 2020 and August 2020 - July 2021 had marginal mandibular nerve injury.

Marginal mandibular nerve injury though has somewhat decreased over time but it still remains a challenge.We tried to identify the said nerve at angle of mandible considering Gonion as landmark, kept it under vision during dissection and avoided use of monopolar cautery to reduce marginal mandibular nerve injury. We also practiced to preserve facial vessels.

8. Post-operative hematoma: Four patients (3.85% among total cases) developed post-operative hematoma in the initial year (2017-2018) of our study.

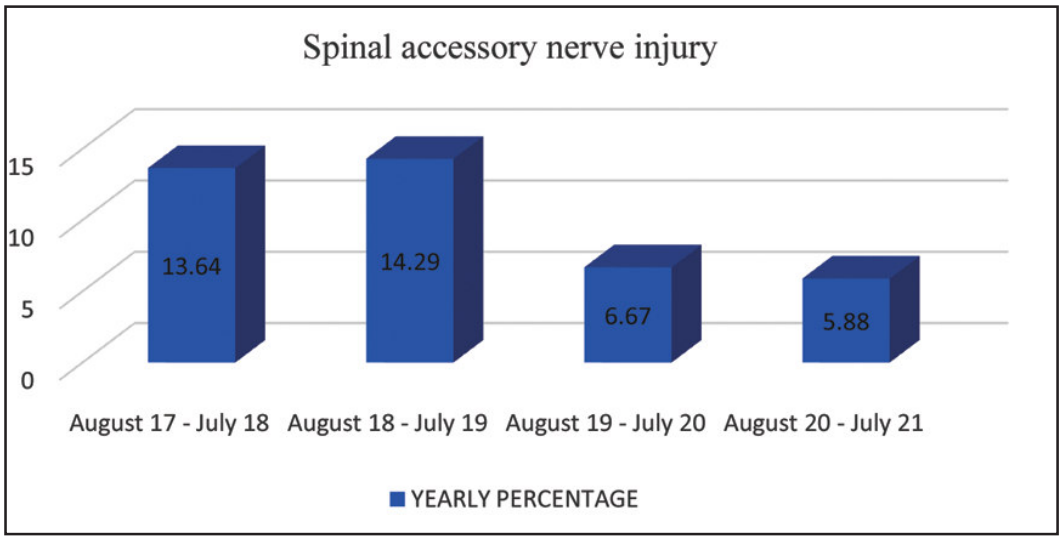

Fig. 7. Yearly percentage of spinal accessory nerve injury

Meticulous haemostasis had helped to reduce the incidence of post-operative hematoma to zero over the years. We used negative suction drain and removed the drain after 48hrs on an average. Proper placement of drainwas also an important factor.

9. Seroma: Two patients developed post-operative seroma between August 2017 - July 2018 and one between August 2018 - July 2019.

   Meticulous haemostasis and adequate duration of drain kept in-situ helped to minimize the chance of seroma formation to zero over the years.

10. Spinal accessory nerve injury: Three patients in the year of 2017-2018, five patients in the year of 2018-2019, two patients in the year of 2019-2020 and one patient in the year of 2020-2021 had spinal nerve injury. Successful preservation of spinal accessory nerve increased with time. We used bipolar diathermy instead of monopolar to avoid thermal injury. We also used saline (0.9% sodium chloride) irrigation with a syringe while working in close vicinity of the nerve.

11. Chyle leak: Four patients between August 2017 - July 2018 and three patients between August 2018 - July 2019 had incidence of chyle leak. None had developed chyle leak whom we operated between August 2020 to July 2021. Meticulous dissection was done and patients were observed closely. Application of Valsalva technique before closing the wound particularly in the left side had helped to reduce the chances of chyle leak.

Discussion

Maximum patients (62.50%) were in the age group 40-59years. 66.35% patients were male, probably linked with the lifestyle issues and addiction habits. According to a study by Masud et al, 76.67% patients were male and 23.33% were female, while age ranged from 31-72 years (Mean=59.1±5.44).[5]

Maximum patients (65.38%) presented with oral cavity squamous cell carcinoma, followed by thyroid malignancy (23.08%), similar to the findings of Malgondeet al.[6]

51.92% patients presented with N1 neck nodal status. Distribution of patients by neck node status in a similar study by Aslani et al was as follows: N1, 16 patients (26%); N2a, 18 (30%); N2b, 13 (22%); N2c, 7 (11%); and N3, 7 (11%).[7]

IJV rent occurred maximum during the initial period. It gradually decreased over time. Dissection from lateral to medial direction and use of scalpel towards the end

rather than using monopolar cautery. IJV should be handled with care during mobilization and its dissection is achieved with a combination of blunt, sharp and extensive but careful application of diathermy.[8]

Marginal mandibular nerve injury though has somewhat decreased over time, still remains a challenge. Intraoperative nerve monitoring is a useful addition to head-neck surgery. While monitoring lower cranial nerves, knowledge of facial nerve monitoring is applied.[9] Though nerve monitoring is being increasingly advocated in this regard but adequate surgical knowledge should be prioritized over nerve monitoring.[10]

Meticulous haemostasis has helped to reduce the incidence of post-operative hematoma to zero over the years. We used negative suction drain. Active drains are more useful than passive drains.[11] Adequate duration of drain kept in-situ helped to minimize the chance of seroma formation.

Meticulous dissection and watchfulness along with Valsalva technique employment before closing the wound have helped to reduce the chances of chyle leak. In inadvertent cases where chyle leak do occur, it can be managed by multiple approaches like nutritional, pharmacological therapies or surgical as stated by Smoke et al.[12]

Successful preservation of spinal accessory nerve increased with time and use of bipolar diathermy also helped to reduce shoulder movement related morbidity (shoulder syndrome). Anatomical landmark of the nerve relying on the location of the Erb's point has been stressed in various literature.[13] Tatla et al describes a quick and persistent way of identification of the spinal accessory nerve deep to the upper tendinous part of sternocledo-mastoid muscle underneath of one or more branch of occipital artery.[14]

According to Popovskiet al, spinal accessory nerve identification over established landmarks is very much dependent on the preoperative mapping of the nerve with imaging diagnostics, but inclusive surgical knowledge further plays important role.[13] A mindful pre-operative assessment, good surgical technique, superior post-operative care and appropriate rehabilitation help in preventing complications.[15]

Conclusion

Neck dissection remains a challenge for the surgeon in terms of its associated risks and complications. Thorough knowledge of anatomy, prediction of anomalous anatomy, precise and careful dissection techniques, meticulous haemostasis and early detection of any complication can aid to decrease the long-term morbidity. It can also smoothen the path to recovery for the patient. Marginal mandibular nerve injury still remains one of the challenges yet to successfully overcome.

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