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ORIGINAL ARTICLE

Complications of Modified Radical Neck Dissection in Patients at Tertiary Care Hospital

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ABSTRACT

Objective: To determine frequency of complication of modified radical neck dissection in patients at a tertiary care hospital Karachi, Pakistan

Material and Methods:

Study design: This is a cross sectional section study, conducted at Department of ENT, for Six months from January 1, 2019 to July 1, 2019. All the patients who fulfilled the inclusion criteria and visited to department of ENT, were included in the study after taking informed consent. Patients were discharged by 48-72 hours postoperatively. Patients were assessed daily till the time of discharge for occurrence of nerve complication, wound complications and vascular complications. Data was entered and analyzed by SPSS 21 software. Mean, Frequency and percentage were given for continuous and discreet data respectively. Chi squire test was applied to detect significance. P value of < o.o5 was taken as significant.

Results: Mean ± SD of age was 40.31±9.54 with C.I (38.62.....41.99) years. Out of 126 patients 84 (67%) were male and 42 (33%) were female. Out of 126 cases complication 46(37%) developed nerve complication, 47 (37%) had wound complication and vascular complication was documented in 27(21%) cases.

Conclusion: surgical complications after modified radical neck surgery are not uncommon. Wound complication was found to be most common followed by nerve and vascular complication. Therefore proper antiseptic measures before, during and after surgery, patient care and careful surgical steps have a role in preventing these dreadful complications.

Keywords: Modified Radical Neck Dissection, Complications, Nerve Complication, Wound Complication, Vascular Complication

INTRODUCTION

Neck dissection is the surgical procedure done for the treatment of head and neck carcinoma for almost a century[1,2]. Many studies have established this fact that radical neck surgery has many complications. Numerous strategies have developed to preserve vital anatomical structures in the neck with adequate removal of cervical nodes[3]. This transition has resulted in fewer complications and lower morbidity, at the same time preserving surgical efficacy and compliance with oncologic principles[4]. The type of neck dissection performed is decided either preoperatively by examination and radiological investigations or during the surgery by seeing the status of neck. Studies have shown that complications of neck dissection affect every surgeon, no matter how experienced or the expert is the surgeon[5]. Hence carefully selecting a surgical technique influences the post-operative complications. Co-morbidities of the patients undergoing neck dissection also have an impact on complications postoperatively[6].

Complications of neck dissection are divided into three major categories: wound complications, nerve complications, and vascular complications. One study has mentioned that wound, nervous and vascular complications were 36.3%, 32.5%, 20%[7].

Outcomes of modified neck dissection are relatively superior[8]. It involves removal cervical nodes from level I to level V but preserves any of these three structures (sternocleidomastoid muscle, the internal jugular vein [IJV], and the spinal accessory nerve [SAN]. MRND type-I preserve Spinal accessory nerve, type 2 preserve the Spinal accessory nerve and Internal jugular vein and type 3 preserve all the three non-lymphatic structures.

To lessen the post-operative complications different strategies have been advocated. Preparation of surgical site well before the surgery and good surgical technique may prevent the occurrence of complications. Measures like taking bath and removal of beard hairs immediately prior to surgery have a great role. Prophylactic antibiotics should be given. Infection can lead to dehiscence and flap necrosis[9]. Good surgical techniques like raising thick flap preserving the blood supply of the flap (subplatysmal plane) with proper closure may help to reduce necrosis and dehiscence

Delicately raising the skin flap is an additional compelling approach. As the skin flaps are elevated below the platysma muscle, several branches of the cervical plexus are immediately encountered overlying the SCM. They supply skin from ear to chest and results in numbness and sensory deficit when injures. Branches of the cervical plexus can also form neuromas, which are very painful[10]. Lingual nerve can be injured during submandibular gland excision. It carries taste sensation from anterior two third of tongue and sensory sensation as well to ipsilateral tongue with resultant difficulty with speech and deglutition[11].

There is robust data regarding complications of radical neck dissection both at international and national level. But data regarding complications of modified radical neck dissection is scarce. This study will highlight the scientific data on common complications of MRND in our population so that the most frequent complications can be brought to the attention of surgeons. This will result in better management.

MATERIAL AND METHODS

This is a cross sectional Study. Conducted at department of ENT. During January1, 2019 to July1, 2019. Sample size was obtained by taking the prevalence of vascular complications (least proportion) in postoperative patients of MRND as 20% (7) confidence interval at 95%and margin of error at 7% and putting this information in Epi Info 7, the sample size calculated was 126. We used Non-probability, Consecutive Sampling technique to collect sample. Data was collected from department of ENT after fulfilling inclusion and exclusion criteria.

All those patients who were of age above 18 years and below 60 years, of either gender, who underwent modified radical neck dissection were enrolled in study after taking informed consent.

Patient who had undergone previous surgery determined on the basis of history, Irradiation therapy, and those with active co-morbities like diabetes mellitus, chronic renal failure and chronic liver disease were excluded. Patients who were having any other malignancy were also excluded. After the surgery patients were discharged by 48-72 hours postoperatively if no other reason to hospitalize the patient. Patients were assessed daily till the time of

discharge for occurrence of nerve complication, wound complications and vascular complications.

A database was developed on SPSS 21. Mean and SD were calculated for age duration of disease. Frequency and percentages were calculated for, type of surgery (I, II,III), and outcome variable i.e. common complications of surgery [vascular, wound infection, nerve]. chi squire was applied to detect statistical significance between categories. P ≤ 0.05 was considered as significant as significant.

RESULTS

Mean age of our patients was 40.31±9.54 years. Baseline characters of our patients are shown in table I.

Table 1: Baseline characteristic of study population (n=126)

Variable	Number	%age
Male	84 (67%)	67%
Female	42	33%
Type of Surgery		
Type I	39	31%
Type 2	36	28.6%
Type 3	51	40.5%

Type 2 surgery had fewer nerve complications as compared to other types. Similarly wound complications were also seen less in type 2 surgeries. Stratification of type of surgery with respect to complication of surgery is shown in Table 2

Table 2. Stratification of type of surgery with respect to complication of surgery (n=126)

Complication of Surgery		Type of Surgery			p-value
		Type 1	Type 2	Type 3	
Nerve Complication	Yes	19(15.1%)	7(5.6%)	20 (15.9%)	0.027
	No	20 (15.9%)	29(23.0%)	31 (24.6%)	
Wound Complication	Yes	20(15.9%)	9(7.1%)	18 (14.3 %)	0.059
	No	19(15.1%)	27(21.4%)	33(26.2%)	
Vascular Complication	Yes	7(5.6%)	11 (8.7 %)	9(7.1%)	0.287
	No	32(25.4%)	25 (19.8 %)	42 (33.3 %)	

Nerve complication was noted in 46(37%) cases, Wound complication was found in 47 (37%) cases and vascular complication was documented in 27(21%) patients as shown in Figure 1

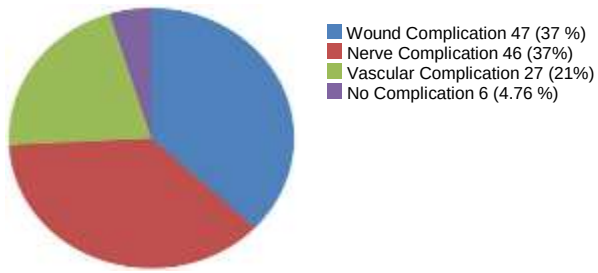

Fig 1: Frequency of wound, vascular and nerve complications

DISCUSSION

Neck dissection is a common procedure performed by almost all otorhinolaryngologists and head and neck surgeons, yet various complications may still occur due to the complex and delicate anatomical structures in the neck region.

The marginal mandibular branch of the facial nerve is at risk during neck dissection while raising the flap. Injury to this nerve causes an obvious cosmetic deformity with deviation of mouth. The marginal mandibular branch can be preserved by making incision 2 to 3 fingers below the body of mandible and subplatysmal plane.

To preserve the spinal accessory nerve it is important to understand its route during dissection of sternocleidomastoid muscle and posterior triangle.

During the ligation of internal jugular vein vagus nerve can be injured, therefore, it is important to carefully open and identify the structures of carotid sheath.

While excising submandibular gland and level I and II dissection hypoglossal nerve can be damaged which results in ipsilateral tongue weakness, difficulty in swallowing and speaking[12].

To prevent intra and post-operative hemorrhage it is crucial to carefully dissect and ligate vessels intraoperatively8. Hematoma formation can be prevented by correctly securing bleeders, placement of drains and its proper care. Damage to carotid is hazardous it can end up with blindness, stroke or even on table death if ruptures. Therefore, it is important to cautiously open the carotid sheath and work over the carotid. Due to residual disease and high rates of recurrence upper jugular nodes should be cleared entirely. In order to preserve it ligate the small branches carefully away from the wall of secured vein[13].

Thoracic duct originates from cisterna chyli in abdomen, ascends between the aorta and azygous vein and crosses towards the left side in thorax and mostly terminates in left internal jugular vein. Basic treatment of chyle fistula is prevention and better understanding of its course. By putting down the patient in Trendelenburg position or forced Valsalva manoeuvre it can be recognized intraoperatively. When feeding is started postoperative leaks are generally spotted[14].

Although the potential complications from this surgery are well documented, there are no local data in our country that comprehensively document and analyses the complications following this surgery in our setting. In our study mean ± SD of age was 40.31 ± 9.54 and disease period was 3.57±1.48 which was closer to studies which reported mean age of 45-56 years[15]. Nodal neck staging (N) at the time of diagnosis leads to the selection of specific type of neck dissection[16]. In our center, MNRD surgery is usually carried out in clinically palpable cervical lymph node cases. Extension of neck disease was judged both pre-operatively through imaging studies and during the surgery as well, in this way decision of RND and extended RND were taken. Tumors with minimal neck diseases or clinically impalpable lymph nodes with potential for occult nodal metastasis were selected for SND with a therapeutic goal[17].

The wound complication rate in our study was 47 (37%). Infection of wound was the major complication which was mostly culminated in abscess formation and wound breakdown. As many as 11 (5.3%) cases of wound breakdown occurred at the 3-pointjunction of the extended limb created during neck dissection for clearance of posterior and lower level of cervical neck lymph nodes. This is the key area for wound breakdown that is why it is important to achieve good hemostasis and carefully suturing the wound. Trifurcations or incisions parallel to carotid artery should be avoided to minimize wound breakdown[18]. Additionally, skin flaps should be elevated in the sub-platysmal plane in order to maximize the blood supply. For preventing the necrosis of wound edges tight closure should be avoided. The occurrence of wound complication was the least in SND group. A slightly insignificant association between the types of neck dissection surgery with the incidence of wound complications was observed in this study with a p-value of 0.059. This is an important predictive factor for wound complications.

Out of the 42 cases, 23 (54.7%) with infected wound were successfully treated conservatively with intra venous antibiotic and daily wound dressing alone. While the other 19 (45.2%) cases requiring various forms of surgical interventions in the form of

abscess drainage or surgical closure of the wound by delayed primary closure (n=11), split skin graft or full thickness skin graft (n=2) or using local regional flap (n=2).

The incidence of nerve complications in our study was (37%) involving 46 cases. Other researcher described a lower incidence of MM nerve injury at 5.5% of all neck dissection sides performed[19]. The lower incidence reported in their study was probably due to a larger sample size. The number of cases may not be a true representation and possibly higher due to lack of proper documentation. In majority of the cases, the status of the great auricular nerve during the intra-operative and post-operative period was not recorded. Although it is deemed as less important nerve functionally for many surgeons, the injury to this nerve would subject the patients to some degree discomfort and numbness of the ear lobules[20]. A significant association between the types of neck dissection surgery with the incidence of nerve complications was observed in this study with a p-value is less than 0.05. This is an important predictive factor for nerve complications.

CONCLUSION

It is to be concluded that wound complication was found to be most common followed by nerve and vascular complication. A careful preoperative assessment, meticulous surgical technique, high-quality postoperative care and appropriate rehabilitation are the cornerstones of preventing and managing these complications. Future prospective, there is a need to conduct more randomized studies using large sample size with multiple study centers in Pakistan are needed to confirm the findings of the present study.

REFERNCES

1. Vigneswaran N, Williams MD. Epidemiologic trends in head and neck cancer and aids in diagnosis. Oral Maxillofac Surg Clin N Am. 2014;26(2):123-41.
2. Burusapat C, Jarungroongruangchai W, Charoenpitakchai M. World J SurgOncol. 2015 Feb 15;13:51.
3. Harish K. Neck dissections: radical to conservative. World J Surg Oncol. 2005 Apr 18;3(1):21.
4. Dimov RS. The effect of neck dissection on quality of life in patients with differentiated thyroid cancer. Gland Surg. 2013 Nov;2(4):219–26.
5. Robson A, Sturman J, Williamson P, Conboy P, Penney S, Wood H. United Kingdom National Multidisciplinary Guidelines. J Laryngol Otol. 2016 May;130(S2):S13–22.
6. 6.Mehanna H, Kong A, Ahmed SK: United Kingdom National Multidisciplinary Guidelines. J Laryngol Otol. 2016 May;130(S2):S181–90.
7. Hishamuddin NHAN, Azman M, Kong MH, Baki MM, Athar PPSH, Yunus MRM.: A Malaysian 13 years review. Bangladesh J Med Sci. 2017;16(3):384–96.
8. Tatla T, Kanagalingam J, Majithia A, Clarke PM. J Laryngol Otol 2005;119(11):906-8.
9. Prim MP, De Diego JI, Verdaguer JM. Neurological complications following functional neck dissection. Eur Arch Otorhinolaryngol. 2006;263(5):473-6.
10. Weiss KL, Wax MK, Haydon RC, Kaufman HH, Hurst MK. Intracranial pressure changes during bilateral radical neck dissections. Head Neck 1993;15(6):546-52.
11. Smoke A, Delegge MH. Chyle leaks: consensus on management? Nutr Clin Pract 2008;23(5):529-32.
12. Walker FD, Cooke LD. Antimicrobial prophylaxis in otorhinolaryngology/head and neck surgery. Clin Otolaryngol 2007;32(3):204-7.
13. Prim MP, De Diego JI, Verdaguer JM, Sastre N, Rabanl I. Neurologic complications following neck dissection. Eur Arch Otorhinolaryngol 2006;263(5):473-6.
14. Smoke A, Delegge MH. Chyle leaks: consensus on management? Nutr Clin Pract 2008;23(5):529-32.
15. Prim MP, De Diego JI, Verdaguer JM, Sastre N, Rabanl I. Neurologic complications following neck dissection. Eur Arch Otorhinolaryngol 2006;263(5):473-6.
16. Kowalski LP, Sanabria A. Elective neck dissection in oral carcinoma: a critical review of the evidence. Acta Otorhinolaryngol Ital. 2007 Jun;27(3):113–7.
17. Grün A, Kuhnt T, Schlomm T, Olze H, Budach V, Stromberger C. Repeat Radiation for Local Recurrence of Head and Neck Tumors and in Prostate Cancer. Dtsch Arztebl Int. 2020 Mar 6;117(10):167–74.
18. Sinha S, Fok M, Goh A, Gadhvi VM. Outcomes after Transverse-Incision “Mini” Carotid Endarterectomy and Patch-Plasty. Vasc Specialist Int. 2019 Sep;35(3):137–44.
19. Balm AJM, Van Velthuysen MLF, Hoebers FJP, Vogel WV, Van den Brekel MWM. Diagnosis and Treatment of a Neck Node Swelling Suspicious for a Malignancy: An Algorithmic Approach. Pathak KA, editor. International Journal of Surgical Oncology. 2010 May 30;2010:581540.
20. Agrup C, Gleeson M, Rudge P. The inner ear and the neurologist. J. Neurol. Neurosurg. Psychiatry. 2007 Feb;78(2):114–2