Evaluation of Salvage Neck Dissection in the Treatment of Head and Neck Cancer

A Clinical Study
Submitted by

Tarek Mohamed Hashem

In partial fulillment of the M.Sc.Degree under supervision of

Prof.Dr Mahmoud Bassiouny
Professor of Surgical Oncology
National Cancer Institute-Cairo University

Prof.Dr Ahmed Farrag
Professor of General Surgery
Kasr El Aini –Cairo University

Prof.Dr Ayman A. Amin
Assistant Professor of Surgical Oncology
National Cancer Institute-Cairo University

Acknowledgment

This work is a humble trial to shed some light on the surgical management of an unfortunate group of patients who experienced a relapse of their cancer.
It is meant as a preliminary evaluation not a comprehensive one as the follow up period did not extend to five years to estimate the five-year survival .The results of the five year follow up are meant to be furtherly analysed in a complimentary study.

This work would have not been accomplished if not for the assistance and guidance of many people to whom i would like to express my gratitude

I would hereby begin with my parents who endured and sacrificed so much to support and build me up.

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Tarek Mohamed Hashem,M.B;B.Ch

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Abstract

Conclusions that can be drawn from our own experience in salvage neck dissection are: Surgery plus or minus adjuvant therapy is the best modality for salvage therapy. Currently radiotherapy and chemotherapy appear to have little advantage over supportive care, although these modalities are used to treat patients who already are least likely to be cured. Patients treated initially with surgery alone are the best candidates for salvage, as previous radiotherapy and/or chemotherapy make salvage less likely. Patients treated initially with radiotherapy alone or in combination show the highest rate of post operative complications and are more technically demanding during salvage. Patients who had early-stage disease initially are most likely to be salvaged.T3/4 cancers have a higher rate of local recurrence, more morbidity and a lesser chance of salvage. PET scan is gaining more importance in the follow up of cases of head and neck cancer in order to detect local or regional recurrence at an early stage which enables more and more cases to be salvaged, which could be reflected on their survival.

In our study we evaluated 19 patients with head and neck cancer of variable primary sites who presented with regional recurrence after finishing their primary treatment. These patients were thoroughly evaluated clinically and radiologically before undergoing salvage neck dissection for their recurrence. The type of neck dissection was left to be decided intraoperatively according to the extent of recurrence and the state of local tissues. The most common type of neck dissection thus performed was extended radical neck dissection. Post operative complications were recorded and regular follow up clinical examinations were scheduled. In conclusion, we believe that salvage neck dissection is a valid option for treatment of patients presenting with recurrent neck disease. However, better evaluation of the primary site and use of reconstructive techniques would maximize the benefits and lower the morbidity of the procedure.

Keywords:

Salvage Neck Dissection
Head and Neck Cancer
Treatment

Introduction

Malignant tumours of the neck comprise the majority of non-thyroid cervical masses in adults.
Up to 80% of these tumours are cervical metastasis from head and neck malignancies.
State-of-the art treatment of patients with head and neck cancer consists of primary surgery,radiotherapy or both,forming a combination therapy aiming at locoregional control.
More recently,chemotherapy was introduced as a part of a multimodality treatment approach,especially for advanced neck disease.
Results of both surgery and radiotherapy are comparable in early stages of the disease.Still,regional failure is reported after the application of each modality and even after their combination.
Byers reported a 2% recurrence rate for patients with N0 necks treated by surgery only compared to 0% recurrence for those treated by surgery and radiotherapy.

The importance of locoregional control in head and neck cancer is derived from the fact that locoregional failure is a major cause of morbidity and mortality compared to malignancies at other sites of the body.
Thus,the management of nodal recurrence in head and neck cancer is still forming a point of controversey.
Salvage surgery (i.e.surgery after failure of initial mode of therapy) presents a highly advocated form of management of regional failure.
In light of the wide spread adoption of "Organ Preservation Strategies" aiming at the improvement of the quality of life and not the mere "cure" per se,the consensus in primary management of head and neck cancer is shifting towards combined or concomitant chemoirradiation.In this aspect,more room is left for salvage surgery in cases of recurrence.

In spite of all forementioned,the results of salvage neck dissection in the treatment of nodal recurrence in head and neck cancer have been evaluated by relatively a few number of authors.

Aim of work:

1-Description of the indications of slavage neck dissection in recurrent nodal disease of head and neck cancer,i.e which type of patient would benefit most from the procedure.

2-Evaluation of complications of salvage neck dissection

3-Description of technical difficulties and their management in the previously manipulated neck.

4-Assessment of the outcome of salvage neck dissection.

The outcome measures would be:

a)Recurrence rate after the procedure,bearing in mind the extent of primary tumour control.

b)Complication rates.

c)Survival.

5-Comparison between different types of neck dissection as a salvage modality for nodal recurrence concerning:

a)indications

b)technical feasibility

c)outcome

Review of Literature

Evolution of Neck Dissection:

Fig.1: Hayes Martin,MD,1892-1977
(Helsper 1989)

In 1622 **Gasparo Aselli** first described the lacteal vessels indicating the presence of a lymphatic system.**Paulo Mascagni** in 1787 and **Sapey** in 1875 published atlases on lymphatics.The standard anatomical depictions of nodes and their drainage were based on **Rouviere'**s descriptions.Surgical removal of nodes has paralleled the anatomical understanding.

In the early 1800s,complete removal of disease was considered impossible once cancer had spread to 'cervical glands'.However,

Warren described an operation for removal of metastatic neck nodes in 1847.A systemic surgical removal of cervical lymphatics and nodes and the first description of radical neck dissection based on anatomical principles was done by **George Crile Sr**.,in 1906.

Originally,the technique included removal of submandibular salivary gland,internal jugular vein,greater auricular and spinal accessory nerves,as well as digastric,stylohyoid and sternomastoid muscles.

It was not until the 1940s when **Hayes Martin**(father of modern head and neck cancer surgery) standardized and popularized the technique.Both **Crile** and **Martin** followed the **Halstedian** principles stating that cancer followed an anatomical stepwise

progress, growing at the primary site to a certain stage,then spreading to regional lymph nodes.
Thus,**Martin** believed that cervical lymphadenectomy for cancer was inadequate unless all lymph-node- bearing tissues were removed.This,he felt was impossible without removal of spinal accessory nerve,internal jugular vein and sternomastoid muscle.
The 1960s and 70s wittnessed a significant change in the attitude towards the surgical treatment of head and neck cancer.
This change was exemplified by the evolution of conservative laryngeal surgery,where preservation of tissue and function was considered without affecting oncologic safety.
Thus in 1967 **Bocca** and **Pignataro** described an operation that removed all cervical lymph node groups but spared the sternomastoid muscle,the spinal accessory nerve and the internal jugular vein.He called this technique "**functional neck dissection**".
Four hundred patients who underwent the new operation showed no difference in survival or recurrence rate than patients treated with radical neck dissection.
In 1989, **Medina** further categorized lymphadenectomies as comprehensive,selective or extended.He suggested the term "comprehensive neck dissection" to be used whenever all the lymph nodes contained in levels I through V have been removed.

Anatomy:

A firm grasp of the basic and applied anatomy of the neck is of utmost importance in providing proper surgical treatment in head and neck cancer.However a detailed description of the anatomy of the neck is beyond the scope of this work.Thus, only the structures that must be considered when performing a neck dissection will be briefly described.

Platysma Muscle

*Origin and insertion:*The platysma is a broad sheet of muscle arising from the fascia covering the upper parts of pectoralis major and deltoid muscles and contained in the superficial cervical fascia. Its fibres cross the clavicle and proceed obliquely upwards and medially below and behind the mental symphysis; succeeding fibres insert into the lower border of the body of mandible anteriorly while laterally and posteriorly they cross the mandible and insert into the skin and subcutaneous tissue.
*Nerve supply:*cervical branches of facial nerve.
*Surgical considerations:*raising skin flaps during a neck dissection is carried out in a subplatysmal plane.This is to provide better blood supply to the flap.Laterally the fibres of the sternomastoid may be confused for the platysma.The fibres of the platysma run antrosuperiorly from its origin while the fibres of the sternomastoid run postrosuperiorly.

Sternomastoid Muscle

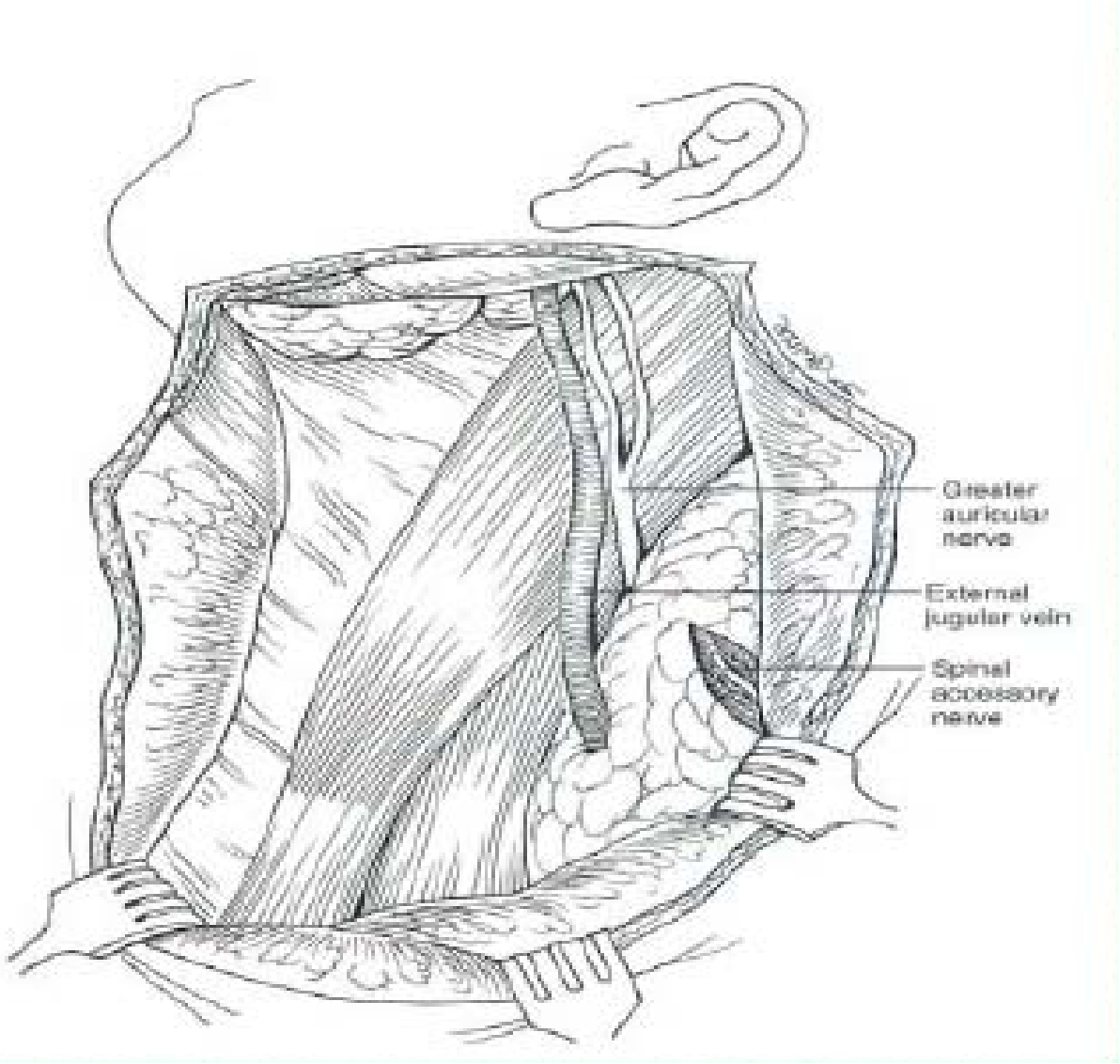

Fig.2: The Sternomastoid muscle (***Muller and Newlands 2002***)

Origin and insertion: invested in the superficial layer of deep cervical fascia,it consists of two heads.One that originates from the medial third of the clavicle (clavicular head) and another which originates from the manubrium sterni (sternal head).These two join together and insert onto the mastoid process of temporal bone.

Nerve supply: spinal accessory nerve (CNXI).The entire nerve may traverse the muscle.It also recieves proprioceptive innervation by cervical spinal nerves from the cervical plexus.
Blood supply: 1-occipital artery or direct from external carotid artery.2-superior thyroid artery.3-transverse cervical artery.
*Surgical consideration:*1-When raising skin flaps care should be taken to leave the supeficial layer of deep cervical fascia overlying the sternomastoid down.This will later be the dissection plane for un -wrapping the sternomastoid and will provide attachement to the contents of the posterior triangle for en bloc resection.
2-Firm lateral retraction on the superior aspect of the sternomastoid allows for good exposure in locating the spinal accessory nerve and in the dissection of the lymph nodes in the submuscular recess.

Omohyoid Muscle