Comparison of the Feasibility and Outcomes of Single Transverse Neck Incision and Modified Schobinger Incision for Neck Dissection

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Abstract: *A variety of incision lines are suggested for neck dissection. The choice of incision design selection should be such that it allows adequate access for good nodal clearance with minimal morbidity and acceptable aesthetics. Different types of incisions such as the utility flaps, Schobinger flaps, McFee, T-shaped, Y-shaped, double Y-, single, and double transverse incisions and their modifications have been described. Not many studies available on single transverse neck incision. Most studies on single incision are based on upper skin crease incision. This study was done to compare conventional incision and single transverse incision, a total of hundred patients were selected and randomised in two groups. These two groups were then compared on the basis of criteria like adequacy of surgical access, flap dehiscence or necrosis, number of lymph nodes retrieved, length of incision, wound contracture, length of hospital stay and cosmetic result.*

Keywords: single transverse neck incision, Modified Schobinger incision, carcinoma oral cavity, neck dissection, head and neck carcinoma

1. Introduction

Cancer of the oral cavity is one of the most common malignancies, [1] especially in developing countries, but also in the developed world [2]. Squamous cell carcinoma (SCC) is the most common histology and the main etiological factors are tobacco and alcohol use [3]. The standard of care is primary surgical resection with or without postoperative adjuvant therapy. Improvements in surgical techniques combined with the routine use of postoperative radiation or chemoradiation therapy have resulted in improved survival statistics over the past decade [4].

Neck dissection is one of the routine surgical procedures performed by the head and neck surgeons. Radical en-block procedure was suggested by Crile for management of metastatic cervical cancer but since then many modifications in surgical procedures and flap design have been documented in the past [5]. A neck incision should permit the maximum exposure of the underlying structures with protection of the major vessels, viability of the skin flaps, good healing potential and an acceptable cosmetic result to minimise postoperative complications [6–9]. Most commonly used incisions include Schobinger and its modifications, Y, T, H or double Y types, which offer good exposure of the neck and can also be combined with the resection of primary lesion in the head and neck. However, the standard Modified Schobinger incision has a tri-radiate point which is known for poor blood supply and hence its breakdown can result in the exposure of the major vessels and poor outcome. In addition, this three-point suture line is cosmetically inferior which gives a high incidence of postoperative wound dehiscence, flap necrosis and scar contracture. The contracture of scar tissue results in deformity and dysfunction, which counts as unacceptable cosmetic result [10].

A variety of incision lines are suggested for neck dissection. The choice of incision design selection should be such that it allows adequate access for good nodal clearance with minimal morbidity and acceptable aesthetics. Different types of incisions such as the utility flaps, Schobinger flaps, McFee, T-shaped, Y-shaped, double Y-, single, and double transverse incisions and their modifications have been described [11–13]. Modified Schobinger incision is the most common incision used for neck dissection. It has the advantage of adequate exposure and the incision can be easily extended anteriorly as lip splitting incision in order to expose the primary oral cavity tumor [14].

This study of hundred patients presents a comparison between routinely performed Modified Schobinger incision with transverse cervical incision in the lower skin crease for neck dissection. This yields adequate exposure for cervical lymph node dissection from level I to V with minimum length of incision and good cosmetic result post-operatively.

2. Material and Methods

This study was done to compare the feasibility and outcomes of single transverse neck incision and Modified Schobinger incision for neck dissection on the basis of surgical access, flap dehiscence or necrosis, number of lymph nodes retrieved, length of incision, wound contracture, length of hospital stay and cosmetic result. Patients having oral cavity cancer with positive metastatic nodal disease in the neck requiring excision surgery were included. Patients requiring a lip split incision for tumor excision were excluded from the study. A total of hundred patients were selected and randomized in two groups. Randomization was done by a

computer-based software on the day of admission with every patient having equal probability of being selected in either group. Transverse cervical incision was placed in group A for neck dissection and a standard Modified Schobinger incision in group B. These two groups were then compared on the basis of criteria like adequacy of surgical access, flap dehiscence or necrosis, number of lymph nodes retrieved, length of incision, wound contracture, length of hospital stay and cosmetic result. Patients were evaluated for the same on post operative day 1, post operative day 7, post operative day 30 and post operative day 90 for flap necrosis, wound contracture and cosmetic result. Surgical access was evaluated on the basis of operative time and need to extend the incision. Cosmetic result was evaluated by visual analogue score.

Surgical technique:
In group A, single transverse cervical incision along a Langer's line at the junction of upper 2/3rd and lower 1/3rd of neck was made of approximately nine to eleven centimeter in length extending anteriorly from anterior border of sternocleidomastoid to anterior border of trapezius posteriorly with the help of 15 number surgical scalpel. In group B, Modified Schobinger incision was placed. Vertical incision was placed at 90° to avoid flap dehiscence; vascular damage and flap necrosis as this technique gives wide surgical access. Lymph node retrieval was done from level I to level V sparing SCM, IJV and SAN.

3. Results

No significant difference between two groups based on age, gender, and side of primary disease. There was no significant difference in stagewise distribution of patients in the two groups. The mean number of lymph nodes retrieved at level I in group A was 9.16 and that in group B was 8.74. The mean number of lymph nodes retrieved at level II in group A was 8.39 and that in group B was 9.56. The mean number of lymph nodes retrieved at level III in group A was 7.72 and that in group B was 8.87. The mean number of lymph nodes retrieved at level IV in group A was 4.33 and that in group B was 4.23. The mean number of lymph nodes retrieved at level V in group A was 5.43 and that in group B was 6.00. The mean no. of lymph nodes retrieved in group A were 35.03 and those in group B were 33.17. The mean surgical time for patients of group A was 59.84 minutes and for those in group B was 54.10. There was no wound dehiscence in group A patients examined on post-operative day 1, 7 and 30. Three patients in group B developed wound dehiscence at trifurcation on post operative day 7, which required secondary suturing. No patient had skin flap necrosis at day 1, day 30 and day 90 in group A and group B. Cosmetic scar in group A was significantly better than that in group B when examined on post operative days 7, 30 and 90. Mean VAS on day 7 in patients in group A was 8.52 and for those in group B was 12.21. Mean VAS on day 30 in patients in group A was 6 and for those in group B was 6. Mean VAS on day 90 in patients in group A was 6 and for those in group B was 6. The mean length of incision in group A was 9.89cm and in group B was 30.54cm. The mean duration of hospital stay of patients in group A was 4.05 days and for those in group B was 4.10 days.

4. Discussion

The present study included 100 patients which were randomised to group A in which single transverse incision was used and group B in which Modified Schobinger incision was used for modified radical neck dissection, group A had 61 patients and group B had 39 patients. There was no significant difference in stage wise distribution of patients in the two groups. There was no significant difference between the two groups in terms of the number of lymph nodes retrieved at level I-V. There was a significant difference in surgical time between the two groups. Neck dissection done with single transverse incision required more surgical time than that done with Modified Schobinger incision. There was no significant difference between the two groups in terms of wound dehiscence and need for re-suturing. The length of incision was significantly different. The mean length of incision in group A was 9.89cm and in group B was 30.54cm. There was no significant difference between the two groups in terms of duration of hospital stay.

A variety of incision lines are suggested for neck dissection. The choice of incision design selection should be such that it allows adequate access for good nodal clearance with minimal morbidity and acceptable aesthetics. In the present study, there is description of transverse cervical incision that gives adequate surgical access without compromising the retrieval of lymph nodes and with better aesthetic outcome as compared to standard Modified Schobinger incision. Different types of incision such as the utility flaps, Schobinger flaps, McFee, T-shaped, Y-shaped, double Y-, single, and double transverse incisions and their modifications have been described [11–13]. Modified Schobinger incision is the most common incision used for neck dissection. It has the advantage of adequate exposure and the incision can be easily extended anteriorly as lip splitting incision in order to expose the primary oral cavity tumor [14]. The Lahey's lateral utility incision is commonly used in post irradiated neck as it has the advantage of not forming a three point junction and prevents wound dehiscence as well as carotid blow out [11]. Transverse cervical neck incision would suffice for supra-omohyoid neck dissections [15, 16]. Post operatively negative suction drains are put for an average period of 3– 5 days. In any head and neck surgery, the postoperative result basically depends upon not compromising resection at the cost of cosmesis [17]. Other considerations are skin characteristics and involvement, unilateral versus bilateral procedures, location of nodal disease and type of dissection, pre – and post operative radiation, previous surgery, need for flap reconstruction and tracheostomy [18, 19]. By reviewing the literature, it was found that many types of aesthetic incision designs were proposed that yield variable results. McFee in 1951 suggested a more cosmetic approach with parallel transverse incisions [20].

The transverse incision used in patients in the present study undergoing unilateral neck dissection allows good exposure of all structures and complete resection of the lymph nodes from level I to V was possible without extension of the incision in majority of patients. The vascularisation of the skin flaps developed using this incision is random in pattern, and its viability is supported by the vascularisation of the

platysma muscle as the skin is raised in a subplatysmalplane. However, if bilateral conservative neck dissections are planned, the viability of the flap should be secured by not extending the lower border of the skin flap caudal to the supraclavicular area and by preserving the facial and the occipital arteries. Moreover, in unilateral neck dissections, another incision design should be chosen such if defects have to be repaired at the base of the flap, as oral tumors have invaded the skin, or if the skin or the platysma muscle adherent to underlying lymph nodes has to be removed. Transverse neck incisions such as the McFee incision do not offer a similar quality of over view of the operating field, and the extensive use of retractors can cause marginal ischemia [20-22].

Moreover, the scars of these transverse incisions are visible and are not as easily covered. Other incision designs such as T or Y type incisions are even more visible and present an equal or greater risk of marginal ischemia at the edges [23, 24]. Guerrissi, JorgeOrlando in 2007 studied the versatility of Modified Schobinger incision and they reported some benefits of this incision like unobstructed vision of an atomic land marks, increased blood supply for the flaps by means of new arterial vessels from the first, second, third and forth internal mammary perforators. They noted partial flap necrosis of 11% cases [25] versus this study noted no partial necrosis post operatively. Omura et al. compared the hockey stick and reversed hockey stick incision. They suggested ask in incision with the longitudinal portion running from the mastoid process downward, 1–2 cm behind the anterior border of the trapezius muscle, curving gently at the acromioclavicular junction to the transverse incision approximately 1 cm below the clavicular margin. This incision showed good results [22]. Dancey and Srivastava suggested placing the longitudinal portion of the incision behind the anterior border of the trapezius muscle, whereas the transverse portion is placed 2cm below the clavicle. 2 patients out of 16 developed marginal skin necrosis but otherwise results were satisfactory [26]. This is in tune with the present study. The scars were mostly acceptable, as resting the incision in natural tension lines minimized the risk of contracture of the scar postoperatively [27, 28]. Those patients where postoperative radiotherapy was indicated, the Modified Schobinger incision was likely at more risk of breaking down at the junction of the horizontal and vertical lines of an incision [29].

The technique of single incision neck dissection used in the present study provides abroad base of blood supply to the skin flap and eliminates the necessity of a vertical incision. In the present study, difficulty was encountered in accessing level I in three cases due to long neck and thus a further extension of incision was needed for adequate exposure to that region. The study defines an incision in the lower neck while most previous studies on single incision neck dissection have been based on incision in the upper neck. All previous studies on single incision neck dissection have smaller sample size than the current study.

5. Conclusion

Transverse cervical incision can be used for surgical procedure for oral cancer patients during neck dissection specially for minimal nodal involvement as it is easy to perform and gives adequate surgical access on proper retraction and yields adequate lymph node retrieval, minimum flap related complications like dehiscence, flap necrosis, wound contracture which in turn affects patient's quality of life like better cosmetic result.

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