**QUALITY OF LIFE OUTCOME MEASURES USING UW-QOL QUESTIONNAIRE V4 IN ORAL CANCER WITH RECONSTRUCTION USING MICROSURGICAL FREE FLAPS**

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**Introduction**

Modern head and neck surgery is characterized by its emphasis on reconstruction and rehabilitation. Before the 1960s the drive to ablate head and neck cancer, seemingly at all costs, frequently resulted in radical ablations with horrible deformities and significant morbidity. Aesthetic and functional considerations were thought to be secondary, and many of these tumors were considered inoperable as ablative attempts produce large composite defects with exposure of vital structures.

Over the past two decades, there has been a steady advance in the available surgical techniques for reconstruction of head and neck defects. Before, surgery most defects, irrespective of size and location, were closed either with local tissues or with random pattern skin flaps that were pedicled and "walked" to the head and neck from the trunk in long, tedious staged procedures (1).

Reconstruction after tumor ablation is considered not only the bridge that allows for aggressive tumor resection, but more importantly the first step in rehabilitation of cancer patients, as it preserves and restores the patient's preoperative level of activity and quality of life (QOL).

Many reconstructive techniques are now available, and the appropriate method of reconstruction, must be based on the surgical defect and on the individual patient's characteristics. Familiality with the different reconstructive techniques facilitates the optimal functional and aesthetic result (2). The unique advantages of free tissue transfer is simplified in the delivery of well vascularized and specialized tissue to the recipient site, and it is significantly applied in the most difficult and challenging reconstructive situations involving, the mandible, pharynx, oral cavity soft tissues of the head and neck (3).

Bone reconstruction is now virtually synonymous with free tissue transfer. Resorption, which plagued non-viable bony transfers, is eliminated. Transferring well tissue incites a strong union with the surrounding bone in as little as one to two months, eliminating the long-term use of reconstruction plates (4,5). Soft tissue transfers capable of sensation are plausible with the use of neurofasciocutaneous free flaps . The long-standing experiences with microvascular technique and the new donor-sites have resulted in reduction and change in the nature of the complications encountered in the literature. The objective of this work is to provide a good functional and aesthetic reconstruction for head and neck cancer patients with complex defects resulted from radical crippling ablation, through microvascular free tissue transfer.

**Aim of the Work**

We have collected data on the patients of head and neck cancer treated with tumor resection and reconstruction with free flap transfer. We were looking for the most affected age group, sex, primary tumor site, pathological and histological type of the tumor, type of neck dissection, method of free flap reconstruction and using of radiotherapy and chemotherapy. Another important aim of our work was study functional results in patients of head and neck cancer treated by tumor resection and reconstruction with free flap.

A further aim of our study was to examine and follow up the changes in the QOL of head and neck cancer patients through comparisons before the surgery and after the surgical resection and reconstruction with free flap transfer after one month, three months, six months and nine months after the surgery.

**Patients and methods**

**Location of Data Collection**

Our work was conducted by collaboration between Maxillofacial, Head and Neck Surgery Unit in Surgery Department in Sohag University Hospitals in Sohag ,Egypt, and Oral and Maxillofacial Surgery Department in Central University Hospital of Oviedo ,Asturias, Spain , between January 2013 and March of 2015 after the approval of ethical committee and taken written informed concent of the patients.

**Patients Charactrestics**

Total number of patients who had been collected for this research study 40 patients .

Of these patients,35 patients (87.5%)were eligible and agreed to participate in this study. Of the other 5 patients (12,5%) : 2 patints (5 %)refuse to participate in this study, 2 patints (5 % )missing in course of study and not caming for contenouse follow up in our department ,1 patient (2.5 %) die in early post-operative period.

So, this thesis included only 35 patients were eligible and agreed to participate in this study and categorized into two groups*:*

***First group:*** Oro mandibular reconstruction group *(10 patients).*

***Second group*:** Soft tissue reconstruction group (*25 patients*) including; oral cavity ,parotid region, mid-face; lateral face and scalp region.

Twenty five 'patients were performed at Oral and Maxillofacial Surgery Unit in Central University Hospital of Oviedo ,Asturias, Spain and 10 patients at Maxillofacial ,Head and Neck Surgery Unit in Surgery Department in Sohag University Hospitals in Sohag ,Egypt.

**Study Design**

This study was conducted as prospective study.

**Pathologic studies**

Biopsy was taken from the primary site (in form of fine needle aspiration cytology, true cut needle biopsy and open surgical biopsy) for histologic examination, and in case of uncertainty of the nature, tumor markers examination was done.

**Uses of University of Washington Quality of Life Questionnaire for patientsof head and neck Cancer:**

The patients were asked to complete 5 sets of questionnaires: the first set was given 1 day before beginning treatment; the second set, one months after the completion of treatment, and the third set, 3 month after the beginning of the surgical treatment, the fourth one after 6 month from starting the surgical treatment, and the last one is after 9month of starting the surgical treatment.. Because the acute effects of treatment typically diminish by 3 months, we administered the second set of questionnaires one month after completion of treatment to evaluate the impact of treatment. The third set was administered 2 month after the second set to measure test-retest reliability because 2 month was considered a sufficient interval to ensure that the patients would not remember their responses to the second set of questionnaires. We continue for our patients follow up for another 2 set after 6 and 9 month from starting the treatment to ensure the effect and result from reconstruction of head and neck cancer by free flaps.

In this study, we use SPSS statistical program version 20.

**Results**

A series of 35 patients with head and neck cancer composite defect after tumor resection underwent 35 reconstructive procedures by microvascular free tissue transfer.

**AGE:**

The average age of patients in this study was 57. (Range of 26 to 88 years).

**SEX:**

Twenty-seven patients were males (27 males) with percentage of 77, 1% and eight patients were females (8 females) with percentage of 22, 9%.

**Patients:**

All patients had definitive preoperative clinical and histological diagnosis. 30 patients are with Squamous cell carcinoma, 3 patients are with mucoepedrmoid carcinoma , one case of adenoid cystic carcinoma of the parotid and one case with retinoblastoma of head and neck region (stage 2 , stage 3, stage 4)..

In this study we have 7 patients with gingival mandibular carcinoma with percentage 20%,11 patients with Carcinoma of anterior 2/3 of the Tongue with percentage 31,4%,3 patients with post 1/3 Tongue carcinoma with percentage 8,6%, 4 patients with cancer floor of mouth with percentage 11,4%,2 patients with Carcinoma of retromolar trigon area with percentage of 5,7%,3 patients' with cancer maxilla with percentage of 8,6%,one patient with scalp carcinoma with percentage of 2,9% and one patient with retinoblastoma with percentage of 2,9%.

**Type of Neck Dissection:**

Our patients undergo two types of neck dissection which divide them in 2 groups:

***First Group***: 29 patients we made for them Functional Neck Dissection with percentage of 82,9%.

***Second Group***: 6 patients' we made for them Radical Neck Dissection with percentage of 17,1%.

**Radiotherapy:**

In our study Some patients' undergo Radiotherapy and rest of patients no, which divide our patients' in two Groups:

***First Group****:* 29 patients taken Radiotherapy with percentage of 82, 9%.

***Second Group:*** 6 patients' not undergo Radiotherapy with percentage of 17,1%.

**Chemotherapy:**

In our study some patients' undergo Chemotherapy and rest of patients no, which divide our patients' in two Groups:

***First Group****:* 19 patients taken Chemotherapy with percentage of 54,3%.

***Second Group:*** 16 patients' not undergo Chemotherapy with percentage of 45, 7%.

**Type of Free Flap Used:**

Of the 35 defects, 10 required a composite osseous flaps for reconstruction (combined bony and soft tissue or oro-mandibular group), and 25 needed only soft tissue flaps (soft tissue group). Primary reconstruction was performed in all cases using five different types of vascularized free flap:

* Antero-lateral thigh free flap in 15 cases with percentage of 42,85%.
* Vascularized free fibula flap in 6 cases with percentage of 17,14%.
* Radial forearm free flap in 9 cases with percentage of 25,71%
* Free Scapular Flap in 4 patients' with percentage of 11,47%.
* Ulnar forearm flap in one patient with percentage of 2,85%

We had 35 successful procedures of flap transfer included in this series, representing a percent of 100%.

The most commonly used recipient *artery* was the common ***facial artery***, 20 cases (Fig. ), the second one was ***superior thyroid artery*** in 15 cases. The most commonly used recipient vein was the common ***facial vein***, 24 cases (Fig. 14) , the second one was ***external jugular vein***. In 13 cases venous drainage was conducted through anastomoses with two recipient veins. End to end interrupted technique using 10/0 nylon suture, was performed for micro vascular anastomoses of both the artery and the vein in all cases.

The operative time ranged from seven to thirteen hours with an average of 10.5 hours for the oromandibular group and 7.3 hours for the soft tissue group.

The main number of units of blood transfused was 1.3 units with a range of 1 to 5 units.

* ***Oromandibular Reconstruction Group***

Ten vascularized free bone flaps were used in reconstruction of composite oro-mandibular defects in 10 patients. Eight patients (80%) were having a composite bone andsoft tissue defects, and two patients were having only bone defects, representing about (20%) of cases .Osteo-septocutaneous fibula was harvested in 4 patients (40%). The mean length of fibula used was **8.7** cm with **range** of **6 to** 12 **cm** .

A skin island was raised in 4 patients based on at least one septo- cutaneous perforator, seen passing through the posterior intermuscular septum. The skin island diameter was a minimum of 3 x 4 cm and a maximum of 8 x 9 cm. The skin paddles were used to cover soft tissue defects in 8 cases.

* **Soft tissue Reconstruction Group**

In this group of patients we reconstruct soft tissue defect, we have 11 patients with Carcinoma of anterior 2/3 of the Tongue with percentage 31,4%,3 patients with post 1/3 Tongue carcinoma with percentage 8,6%, 4 patients with cancer floor of mouth with percentage 11,4%,2 patients with Carcinoma of retromolar trigon area with percentage of 5,7%, 3 patients' with cancer maxilla with percentage of 8,6%,one patient with scalp carcinoma with percentage of 2,9% and one patient with retinoblastoma with percentage of 2,9%.

The size of the defect following resection ranged from 3\*6 cm to 10\*15 cm'. Anatomically these defects could be divided into;

* Tongue defect (Lateral, Anterior, Posterior).
* Soft tissue Defect in floor of mouth.
* Compound maxillary defect.
* Soft tissue defect of retromolar trigon.
* Soft tissue defect of parotid region ( soft tissue – skin) .

We used three types of flaps, antero-lateral thigh free flap in 15 patients with percentage 42.85%, the radial forearm free fascio-cutaneous flap was used for reconstruction in 9 patients with percentage 25.71% , Ulnar forearm flap in one patient with percentage of 2,85%.

**DISCUSSION**

In this study, patient's data were collected from patients in Oral and Maxillofacial Department in the Central University Hospitals of Asturias in Spain in collaboration with Maxillofacial Unit in General Surgery Department , Sohag University Hospitals in Egypt between 2013 and 2016, in accordance to approved institutional review board guidelines.

We was looking for the most affected age group, sex, primary tumor site, pathological and histological type of the tumor, type of neck dissection, method of free flap reconstruction and using of radiotherapy and chemotherapy. Another important aim of our work is study functional, surgical and aesthetic results in patients of head and neck cancer treated by tumor resection and reconstruction with free flap.

A further aim of our study was to examine and follow up the changes in the QOL of head and neck cancer patients through comparisons before the surgery and after the surgical resection and reconstruction with free flap transfer after one month, three months, six months and nine months after the surgery and to investigate whether our free flap reconstruction methods can improve the QOL of head and neck cancer patients significantly.

***Primary Site:***

The most commonly affected primary sites were thetwo-thirds of the tongue in 11 patients (31.4%), followed by the gingiva mandibular in 7 patients (20 %), floor of the mouth in 4 patients (11.4 %), posterior third of the tongue in 3 patients (8.6 %), maxilla in 3 patients (8.6 %), parotid gland in 3 patients (8.6 %) and retromolar region in 2 patients (5.7 %). Thomas *et al.(30)* examined 77 patients, in 34 (44%) of whom the tumor was in the tonsillar fossa, and in 20 patients (26%) in the tongue. Kruse *et al.(31)* studied 99 elderly patients with HNC and found that the maxillary and mandibular alveolar ridges (24% each) were the most affected, followed by the tongue (18.9%). In the 47 patients in the study by Biazevic*et al.*(32), the tumor was in the oral cavity (the floor of the mouth, the gingiva, the retromolar area or the palate) in 19 cases (40%) and, in the oropharynx in 12 cases (25.5%), with 11 in the tongue (23.4%). Kim *et al.(*33*)* conducted a study on 133 patients, and found the tonsillar area to be affected in 89 cases (66.9%), the base of the tongue in 23 (17.29%) and the soft palate in 15 patients (11.28%).

***Method of Treatment :***

The most frequently applied treatment method was surgery together with radiotherapy in 29 patients (82.9%), whereas 6 patients (17.1%) were treated with surgery only. This result is larger than the results of Rinkel*et al.(*34*)* (50%), Nazar*et al.(*35*)* (47.2%) and Kim *et al.(33)* (71.2%). Scharloo*et al.(*36*)* found that the use of irradiation alone was the most frequent treatment method (40.7%). In the investigation by Thomas *et al.*(37), 88.3% of the patients received primary or adjuvant radiotherapy. Vartanian*et al.(*38*)* (2004) examined 301 patients, 158 of whom (52.5%) underwent only surgery, 34 (11.3%) were irradiated, and 98 (32.6%) received a combination of surgery and radiotherapy. Nalbadian*et al.(*39*)* found surgery alone to be the most commonly applied treatment method (54.1%). In the study by Verdonck-de Leeuw*et al.*(40), radiotherapy was the most frequently applied treatment (32%), followed by a combination of surgery and radiotherapy (27%). Hassanein*et al*.(41)reported surgery as the most common (70%) treatment method, with surgery combined with radiotherapy (18%) in second place.

The tumor localization and the treatment method, together with the general disease stage, play essential roles not only in the treatment of HNC, but also in the incidence and intensity of the side-effects and the QOL (Alicikus*et al.*, 2009).(42).

**7.3: Discussion of each domain separately**

**Pain**

In the pain score we show the significance *p* value (below 0.005) shows an effect of time in dependent variable which is the pain; and we show subject effect reflected repeated measures. The test shows significance interaction between pain and time level, this mean that level of pain occurred over 9 month had significance correlation.

After summation of the mean of pain item in all the patients, preoperatively, and compare it with the mean after 9 month of follow up, we found significant increase of the summation from 76.429 and become 99.286 and this indicate the success of our resection and reconstruction by decreasing the level of the pain gradually with progression of the time after the surgery.

Our patients show similar results regarding the domain of the pain with another works like the work of Herce J, Rollón*et al* (43) in 2007 published on a sample of 23 patients found that high scores also correspond to the pain and also in the work of Rogers et al (44). andHammerlid and Taft *et al* (24), although they find statistical significance correlation of the pain as regard to the time.

Our good results in the pain dimension correspond to those published by other authors like Rogers et al (44), Hammerlid and Taft *et al* (27), found positive results but no significant differences in the pain. We believe that the~~se~~ differences reported in these studies are specific and detect sharp peaks of pain from other sources not related to pathology and oncology, and they do not affect other dimensions as vitality, and general health physical function, where the results are better than the general population. It would be necessary to use of tests specifically designed to detect the problems that cause our treatment in patients with HNC .

**Appearance**

In the appearance score we show a significantly effect of time in the dependent variable, i.e. appearance; and we show subject effect reflected repeated measures. The test shows significance interaction between appearance and time level, this mean that level of appearance occurred over 9 month had significance correlation with time.

As regard to the analysis of the appearance score over the nine months we show mild improvement of the appearance near the previousone when we are compared the preoperative (85.00) and 9 month post operative (77.85).

Also patients over time tend to cope and adapt and this will mean that they are likely to give better scores than those during the early post-operative period.

Overall the response rate was acceptable (66%) and comparable to other studies.There was no key difference between the responders and the non-responders. Appearance was increasingly rated as one of the three most important issues in the previous week the lower (worse) UWQOL appearance score. These data also reflects the importance of oral functioning and although appearance was important, it was overall a relatively lesser issue with patients. This study indicates that the patients who report a problem with appearance are more likely to have appearance as a major issue in combination with a set of other domains. Around a quarter of the patients had either notable issues regarding their appearance or were bothered by it.

The main problems patients reported on UWQOL regarding aspects of their appearance they were most concerned about were the mouth and the face. However a significant number of patients were also concerned about their teeth and neck, with others reporting problems with lip, speech, chin and the donor site. The patients reported disfigurement and scarring as the significant issues. Others reported quality of speech, dribbling of saliva and droopy smile as other related appearance issues and this correlate to Hassanien.K et *al* 2001(41).

In the wording of UWQOL questionnaire seems to give a clear demarcation between minor changes in appearance and something more significant and this is reflected in theanswers of the patients.

**Activity**

In the activity score we show a significantly effect of time in the dependent variable, and we show subject effect reflected repeated measures. The test shows significance interaction between activity and time level. This mean that level of activity occurred over 9 month had significance correlation with time and patients with time become more active and regain to normal or near the normal activity.

As regard to the analysis of the activity score over the nine months we show perfect improvement of the activity more than the previous one when we compared the preoperative (92.85) and 9 month post operative (95.71). In activity domain we conclude from this resultthatthe level of the activity is affected by disease preoperatively and after resection of tumor and reconstruction with free flap and with time the activity of the patients is become improved.

**Recreation**

In the recreation score we show a significantly effect of time in the dependent variable recreation; and we show subject effect reflected repeated measures. The test shows significance interaction between recreation and time level. This mean that level of recreation occurred over 9 months had significance correlation with time and patients with time become more enjoying and regain to normal or near the normal recreation.

As regard to the analysis of the recreation score over the nine months we show perfect improvement of the recreation near the previous one when we ~~are~~ compared the preoperative (90.71) and 9 month post operative (95.71). In domain of recreation we conclude from this result that the level of the recreation is affected by disease preoperatively and after resection of tumor and reconstruction with free flap and with time the recreation of the patients is become improved.

The best improvements following resection and reconstruction with free flap were in activity and recreation.

**Swallowing**

In the swallowing score we show a significantly effect of time in the dependent variable swallowing, and we show subject effect reflected repeated measures. The test shows significance interaction between swallowing and time level. This mean that level of swallowing occurred over 9 months had significance correlation with time and patients with time we note the improvement of swallowing near the normal activity.

In the swallowing domain we observed a worse result in scale as the score of patients preoperative was (80.82 %), after one month postoperative was (39.42%) and this number indicate the patients cannot swallow in the post-operative period and this domain is increased in upcoming 9 month which was after 9 month (77.42%) and this mild improvement.This findings indicate that deglutition outcomes after reconstruction of the head and neck by means of microvascular free-tissue transfer are likely to be satisfactory, provided other circumstances relating to food transport are close to normal.

This improvement is correlated to the result of Kazi *et al* (2008)(48). Otherwise, Biazevic*et al (*49*)* found swallowing (24%), chewing (48%) and speech (44%) to be the most prevalent complaints at the time of treatment, and chewing (60%) and swallowing (52%) at the 1-year follow-up. It is interesting that Rogers *et al.* (2007)(50) found no trouble with swallowing and chewing in 45% of the patients in their study group.

The swallowing problem associated with the treatment of HNC in our study was that 2.8% of patients had most or all of their nutrition through a gastrostomy feeding tube. Only 55 % of patients had normal diet, whilst, 42% had pureed food. These outcomes are better than to other published reports. Pauloski*et al*(51) relay more than 50% of oropharyngeal cancer patients as having non-normal diet and 13% feeding tube dependence at 1 year post radiation with or without chemotherapy. In Mowry et al.’s (52) study of patients with chemo-radiation for stage 2–4 oropharyngeal cancer and a mean follow-up of 11 months, six out of fourteen patients scored 30% or less in the swallowing domain of UW-QOL. In a survey of 12 patients who had surgery with free flap reconstruction and post-operative radiotherapy for advanced tongue base tumours, Winter and colleagues *et al* (53) reported a mean score in swallowing domain of UW-QOL as 47.5, compared to the mean score of 77.42 in our study. In another study the feeding tube dependence for patients with stage 3–4 oropharyngeal cancer who had surgical excision with free flap reconstruction and postoperative radiotherapy was 50%.

We also did not find any correlation between swallowing function and age, gender, or nodal status, and this result is similar to L Thomas 2007(54).

**Chewing**

Here we show a significantly effect of time in the dependent variable chewing, and we show subject effect reflected repeated measures. The test shows significance interaction between chewing and time level, this mean that level of chewing occurred over 9 month had significance correlation with time and patients with time we note very little improvement of chewing near the normal activity.

In the chewing domain, we observed a worst result in scale as the score of patients preoperative was (64.82), after one month postoperative was (12.85) and this number indicate the patients cannot chewing in the period post operative and this domain is increase in upcoming 9 month which was after 9 month (54.28) and this is very little improvement toward preoperative level.

In this study chewing is the worst result and this correlated with the result of HassanienK *et al* 2001 (55) and Kazi *et al* (2008) (56). Otherwise, Biazevic*et al.(*57*)* found chewing (48%) and speech (44%) to be the most prevalent complaints at the time of treatment, and chewing (60%) and swallowing (24%) at the 1-year follow-up. In their study, chewing was the QOL domain which exhibited the largest reduction in rating, from 74.0 at baseline to 34.0 1 year after surgery. It is interesting that Rogers *et al.* (2007) (58) found no trouble with chewing in 45% of the patients in their study group.

In their study, chewing was the QOL domain which exhibited the largest reduction in rating, from 74.0 at baseline to 34.0 1 year after surgery.

**Speech**

Here we show a significantly effect of time in the dependent variable speech, and we show subject effect reflected repeated measures. The test shows significance interaction between speech and time level, this mean that level of speech occurred over 9 month had significance correlation with time and patients with time we note very little improvement of speech near the normal activity.

In the speech domain it has been observed that the worse result in scale as the score of patients preoperative was (83.71), after one month postoperative was (38.57) and this number indicates the patients cannot speak as it in the postoperative period and this domain increases in upcoming 9 months which was after 9 month (73.14) and this is very little improvement toward preoperative level.

In our study we found that patients treated for oral cancer speech with difficulties. This was observed by speaking with the patients postoperatively and we noted the voice and speech quality was altered and this affection showed mild improvement with the time but not regain to normal function or near normal.

We report in our study that patients afflicted from T3-4 tumours had worse voice, speech intelligibility and dysarthria severity results due to wide area of resection and wide reconstruction flap and high dose of radiotherapy. Worse outcomes with increasing T stage have been reported with Brown J.S *et al (*59*),* Pauloski B.R *et al(*60*) and* Zuydam A.C *et al (*61*).* It has been seen from our UW-QOL results that only 25% of the patients have near normal speech after resection and reconstruction with free flap for oral cancer specially in cancer of the tongue and floor of mouth. The majority, about 63% have only mild speech and articulation impairment. However, 12% had major speech impairment.

Some reports highlight good speech results in oral cancer patients. There was no subsite specific association seen with speech and voice outcomes, and has been reported by others as well (Colangelo LA *et al* (62) and Chandu A *et al*.(63). There are reports of soft palate tumors leading to different speech outcomes compared to other oropharyngealsubsites.

Free-flap reconstruction has had an impact on all aspects of speech and voice. Thomas, L., Jones, T.M. 2009 (64) reported that speech domain mean scores on UW-QOL were worse by about 20–25 points for those who had radiotherapy, late stage disease and free-flap reconstruction. Another study identified only extent of resection and use of free-flap as significantly related to post-treatment speech intelligibility. Few reports reported speech outcomes in oncological patients reconstructed with free-flap. Radiotherapy did not affect the speech intelligibility or articulation in other reports.

From our point of view, the four-point scale for speech in UW-QOL may not be enough for detailed speech assessment and rehabilitation. Thus UW-QOL seems to be quite sensitive and an appropriate screening tool for assessment of speech disability in

this group of patients. It is quick and easy to complete and does not add major financial or manpower burden to administer. For this reason, we need well-developed voice assessment tools for study the assessment and rehabilitation of the speech and voice after oral and oropharyngeal cancer resection and reconstruction with free flaps.

**Shoulder**

Here we show a significantly effect of time in the dependent variable shoulder, and we show subject effect reflected repeated measures. The test shows significance interaction between shoulder pain and time level, this mean that level of shoulder pain occurred over 9 month had significance correlation with time and patients with time we note a good result of improvement of shoulder pain near the normal activity. In the shoulder pain domain we observed a good result in scale as the score of patients preoperative was (100), after one month postoperative was (81.42) and this number indicate the patients can move his shoulder with some limitation in the postoperative period and this domain increased in upcoming 9 month which was after 9 month (91.42) and this is very good improvement toward preoperative level.

Dysfunction of the shoulder and neck after neck dissection can result in poor quality of life. The importance of shoulder function in activities of daily living is evident from the questions asked in the shoulder-specific questionnaires. Difficulties with dressing, writing, driving, lifting light objects, and reaching for things can have a serious effect on social activities, recreation, and work. Van reported that reduced abduction and neck pain were related to poor outcome in several domains of quality of life, and were associated with depression. Although the UW-QOL is well established, no studies have compared the shoulder domain with other more recent shoulder-specific functional questionnaires. Such comparisons help our understanding of how patients score the UWQOL shoulder domain. This is a weighted test that combines scores for patients’ symptoms and objective measures of range of movement and strength of the shoulder. Thirty-five percent of patients reported either “pain or weakness in my shoulder has caused me to change my work/hobbies” or “I cannot work or do my hobbies because of problems with my shoulder”. After modified radical or radical dissection, patients scored worst. However, despite objective and subjective deficits after neck dissection, the shoulder domain ranked as one of very important domain in the UW-QOL questionnaire. This reflects the importance of other functional aspects such as swallowing, saliva, speech, and chewing in patients after treatment of oral and oropharyngeal cancers. Morbidity in the shoulder and neck after neck dissection is well recognized. Physiotherapy has an important role in promoting function and reducing pain by maintaining length of muscles, range of movement, and preventing secondary complications such as adhesive capsulitis. Rogers *et al*. published article in 2007 (65) where they saidthatprogressive training in resistance exercises may improve scapular stability and the strength of the upper extremity and serve as an adjunct to standard physiotherapy. Pain in the shoulder after neck dissection can be problematic, and is associated with a restricted range of movement. In a pilot study, reported fast and significant reduction of pain after neck dissection with only one session of injections of botulinum toxin type A into trigger points of painful muscles.

**Taste**

Regarding taste, here we show a significantly effect of time in the dependent variable taste, and we show subject effect reflected repeated measures. The test shows significance interaction between taste and time level. This means that level of taste occurred over 9 month had significance correlation with time and patients with time described the improvement of taste to multiple food and fluid near the normal taste. In the taste domain we observed a very good result in scale as the score of patients preoperative was (98.82 %), after one month postoperative was (80.28%) and this number indicates the taste of the patients decrease as result to surgical resection and reconstruction with free flap in the postoperative period and this domain is increased in upcoming 9 month which was after 9 month (95.71%) and this was a very good improvement in the taste domain . This finding indicates that taste domain outcomes after reconstruction of the head and neck by means of microvascular free-tissue transfer are likely to be satisfactory, provided other circumstances relating to foods and fluids are close to normal.

We observed in this study 2 patients (5.7%) with cancer of anterior two-thirds of the tongue with significant impairment of taste in postoperative period due to resection of large part of the tongue more than the half of the tongue, after follow-up of the patients for 9 month we notice significant improvement of taste domain of those patients.

**Saliva**

Regarding salivation, here we show a significantly effect of time in the dependent variable saliva, and we show subject effect reflected repeated measures. The test shows significance interaction between saliva and time level, this mean that level of saliva occurred over 9 month had significance correlation with time and circumstances and factor that affect patients in post operative period like post operativeradiotherapy and patients with time we note the decrease in volume of saliva to multiple food and fluid to the normal saliva.

In the saliva domain we observed a the second worse item in this study with bad results in scale as the score of patients preoperative was (100 %), after one month postoperative was (94 %) and this number indicates that the saliva of the patients decreases as result to surgical resection and reconstruction with free flap in the period post operative and this domain is clearly decreased in upcoming 9 month which was after 9 month (78.57%) and this result is worse in the saliva domain. This finding indicates that saliva is strongly affected with surgical effect and post operative radiotherapy effect.

**Mood**

Regarding mood, here we show a significantly effect of time in the dependent variable mood, and we show subject effect reflected repeated measures. The test shows significance interaction between mood and time level, this mean that state of mood occurred over 9 month had significance correlation with time and circumstances and factors that affect patients in post operative period. In this series, we noted that patients with time showed a significant improvement of level of the mood and the family support did not show any significant change and all feeling answers were equally positive. This is good from the aspect of the QOL because it means that the family stands up for the patients in their enormous problems and helps them in the healing period.

In the mood domain, we observed a very good improvement in scale as the score of patients preoperative was (62.85 %), after one month postoperative it increased and it was (70 %). This number indicates the patient satisfaction to surgical resection of the tumor and reconstruction with free flap either in hospital stay or few days after discharge. Mood of the patients is clearly increase in upcoming 9 month which was after 9 month (96.42%) and this result indicate excellent improvement of psychological aspects of our patients.

**Anxiety**

Regarding anxiety, here we show a significantly effect of time in the dependent variable anxiety, and we show subject effect reflected repeated measures. The test shows significance interaction between anxiety and time level, and this mean that level of anxiety occurred over 9 month had significance correlation with time and circumstances and factors that affect patients in post operativeperiod. Patients with time we note significant improvement of level of the anxiety and this supported by family relations did not show any significant change and all feeling answers were equally positive. This is good form of the aspect of the QOL because it means that the family stands up for the patients in their enormous problems and helps them in the healing period .

In the anxiety domainweobserved a very good improvement in scale as the score of patients preoperative was (50.28 %), after one month postoperative it increased and it was (65.42 %) and this number indicate the patient satisfaction to surgical resection of the tumor and reconstruction with free flap either in hospital stay or few days after discharge. Level of anxiety of the patients is clearly decrease in upcoming 9 month which was after 9 month (96.42%) and this result indicate excellent improvement of psychological aspects of our patients and the patient not thinking in bad manner in their diseases .

**Conclusions**

Microvascular free-tissue transfer has become the best reconstructive modality of choice for many patients after head and neck cancer ablative surgery. Modern assessment of outcome after such surgical procedures now includes evaluation of QOL. Our series is a prospective study that have analyzed QOL after head and neck reconstructive surgery in Spain and in Egypt using UW-QOL.

Oncologic surgeons must think of all the options available from the reconstructive ladder for the management of cancer defects as it is often possible to carry out adequately safe surgical resection yet provide good function using free flaps .microvascular free-flaps offer a reasonable method for reconstruction of large oral and head and neck defects.

* The University of Washington Quality of Life questionnaire, version 4 (UW-QOL), a head and neck cancer (HNC) disease-specific questionnaire, is well-validated, brief, simple to process, and proven to provide clinically relevant information, particularly in HNC.
* Patients who score is equal to 100 or higher of 100.This should be clarified. 100 on the UW-QOL, which occur in early stages, do not require further evaluation. Those who score is below 70 could benefit from regular follow up to help clarify the specific problem and the impact of treatment on his quality of life domains