SURGICAL PROCEDURES (SHUNT OR FISTULA OPERATIONS) FOR VOICE REHABILITATION AFTER TOTAL LARYNGECTOMY

ESSAY

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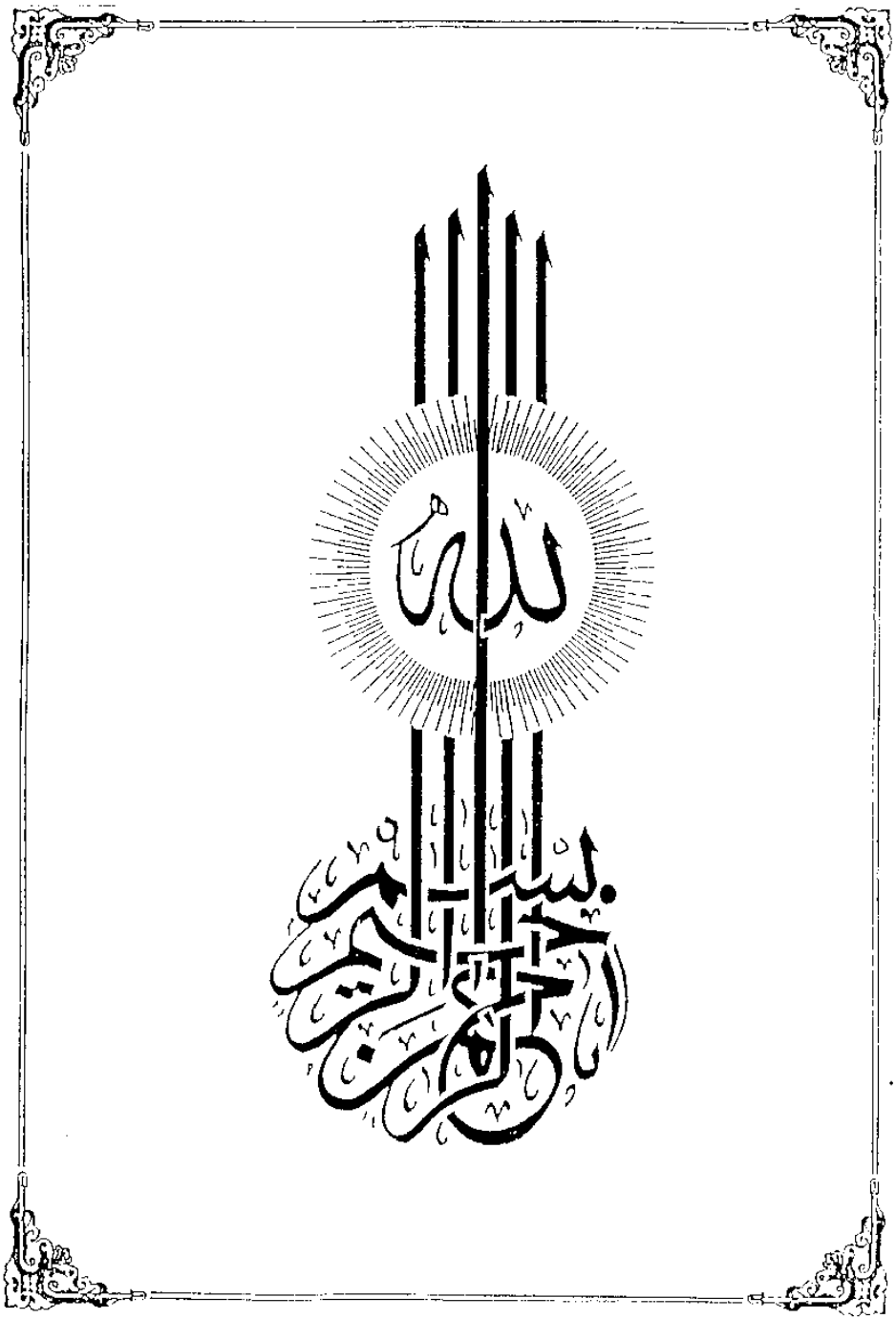

I. Introduction ...

Introduction

Speech is a very important way for communication between people and allows them to share their thoughts with each others. Normally the voice plays musical accompaniment to speech rendering it tunneful, pleasing and audible being essential to effecient communication by spoken words.

The fundamental factors in production of voice are: first a vibrating column of air, secondly the natural modulating effect of the resonators including the oral, nasal and pharyngeal cavities, and lastly the articulating mechanism of the tongue, palate, velopharyngeal valve, jaw and lips. Following total laryngectomy, except for the natural central generator of voice vibrations (the larynx), all other factors are intact and functional while the air way is totally separated from food passage and respiration is seperated from speech and the patient respirs through a tracheostome.

The loss of speech following total laryngectomy constitute a severe blow to the patient's functional and psychological well-being. Total laryngectomy remains today an effective method of treating advanced laryngeal cancer, which can not be eliminated by partial surgery of the larynx.

Many patients achieve cure or long survival, and early restoration of adequate speech communication is the main part of their rehabilitation. Voice rehabilitation after total laryngectomy includes the following alternatives, esophageal speech, electronic or mechonical vibrators and lastly surgical intervention.

Although the esophageal speech is still the generally accepted method for voice but for the inherent disadvantages and the undesirable effects of delayed speech recovery there should be urgency in achieving adequate speech rehabilitation by using surgical procedure.

It was hoped that a new operation to supply adequate air easily for phonatory purposes would eliminate the "gulping" technique, and permit the patient to talk with ease.

The new technique can be carried out at the time of the primary excision, or as a separate, secondary procedure. Individuals who have had the larynx destroyed by irradiation comprise a smaller group who can usually not be benefited by vocal rehabitation operations.

Individuals who have been subjected to extirpation of the larynx and have not mastered esophageal speech, or adjusted to an artificial mechanism; and who desire speech development, may be considered for the rehabilitation operation. (Conley 1959)

The object of all surgical methods for the restoration of voice is to create a communication between the airway and the food passage, with the intention of producing vibrations of an air column in the pharynx through the expired air. In the past, these methods have failed to be generally accepted in surgical practice, for two reasons: one was the frequent leakage of saliva and food into the trachea; the other was stenosis of the newly created tracheo-pharyngeal communication. (Tiwari et al. 1982).

In the last twenty years, surgical advances in the contruction of controlled fistulas have shown clearly that speech of superior quality and power can be produced when expired air from the lungs is diverted from the trachea into

the pharynx or esophagus, (Edwards , I974).

Generally speaking there are basically two types of shunts that can be performed :

I. Internal or direct shunt (anatomic shunt).

The air is shunted by a finger over the tracheostoma into a soft tissue tube entering the pharynx or esophagus. Asai's reconstruction (I960) and recently Komorn's reconstruction (I974) are classical examples. The most recent procedures of internal shunt emphasize the use of a valved prosthesis to decrease salivary leakage and aspiration, examples of these are Singer-Blom (I980) and Panje procedures (I98I).

II. External or indirect shunt (extra-anatomic shunt):

This procedure requires a connecting prothesis between tracheostoma and the pharynx which may incorporate a mechanical vibrator in place of soft tissue pseudo-glottis, examples of these are prothesis deviced by Taub (I973) and Edward (I974).

The original shunt and the first to be done was an external one (extra-anatomic) done by Gussenbouer after, a successful laryngectomy first performed in I873, using a secondary mechanical device.

In I93I, Guttman was the first to perform the internal tracheo-pharyngeal shunt using the electrocautery.

Later on the emphasis is shiffed to the internal shunts in the period between I969-I98I.

Recently, European and Japanese laryngologists proposed "subtotal" laryngectomy or reconstructive "neoglottic" surgery.

A primary near-total resection of the larynx was possible with reconstruction of the pharynx and trachea permitting not only a phonatory functioning shunt, tolerable aspiration, but also in some cases restoration of the oral nasal respiratory tract (Singer 1983).

A historical framework of these operations is mentioned in this work, with selection of the most recent and widely accepted surgical procedures to be discussed in more details.

2. Aim of the work ...

Aim of the work

The aim of the work is to study the different types and techniques of tracheo-esophageal shunt operations with stress on the most recent surgical procedures for voice rehabilitation after total laryngectomy in order to formulate the proper choice of patients for such surgical intervention.

3. Voice rehabilitation after total laryngectomy

Voice rehabilitation after total laryngectomy

After total laryngectomy, the larynx with the vibrating column of air are lost, laryngeal voice production is replaced by one of the following sources of vibrations:

I. Electronic or mechanical vibrators:

- -Internal.
- -External through neck tissues.
- -External through tube in fistula or mouth.

II. Introduced air:

- -Esophageal speech.
- Expired air via internal shunt.
- -Expired air via external shunt and connecting tube.

Esophageal speech has for many years been the generally accepted method for voice production after total laryngectomy as it is a standerd method, universally applicable, needs no additional surgery and no external apparatus.

But esophageal speech has a limited power of voice, it is unphysiological, it is a new technique to be learned and has a considerable failure rate especially in old aged patients.

The proportions who are classified as failures in esophageal speech varies according to criteria of assessment used.

At the best, some twenty per cent are regarded as failures, at worst fifty per cent and other writers rates are about one third as failures (Edward I974).

For a patient, in order to master esophageal speech, he must develop a method for taking air into the esophagus either by swallowing or by elevating the rib cage and expanding the chest. This ingested air must be returned to the pharynx where it is converted to sound by a constriction of the hypopharynx forming a "pseudoglottis".

Those patients who cannot learn esophageal speech lack the effeciency of ingesting air into esophagus and returning it to the hypopharynx or they lack the function of the sphincter at the pharyngeal level (Montgomry,1974).

When radiation therapy fails initially or when some years later there is a recurrence of cancer, there often ensue complications in healing of the throat tissues.

The cervical oesophagus may itself be involved and various forms of reconstructive surgery may be necessary with colon or stomach transplants. In any event the crico-pharyngeal sphincter is necessarily sacrificed. In these cases of radical surgery acquisition of pseudo voice may be impossible or such voice as is produced is weak in volume and maintained only for a period of two or three words per lung inspiration.

These patients together with esophageal speech failures are generally offered some types of externally applied electronic or mechanical vibrators(electro-larynx), but these have not achieved much popularity as the voice produced sounding harsh, unnatural and metalic. Also not all the patients can use them with success after radical surgery of the neck.

Also the tissues remain oedematous and unelastic, hard to touch for many months after radiotherapy with formation of scar tissue.

nder these conditions, sound transmission via electronic vibrators s reduced and the pharynx cannot pick up vibrations when placed n the external neck surface.

Another problem concerned with the use of electronic ibrators is that the throat may be anaesthetic so that the patient inds it difficult to place the head of the vibrator flat upon the kin,without which success is impossible on account of escaping ound.

he patient may also find it difficult to place vibrator in exactly he right place each time and at exact moment he wishes to speak Green,I974).

In cases of esophageal speech failures and when the patients annot use electronic vibrator or dislike using it, surgical ehabilitation in the form of tracheo-esophageal shunt operations an be used.

here is rapid speech recovery after surgical procedures, especially he recent tracheo-esophageal puncture procedure, and the patient an speak two to three days after operation.

his helps to avoid undesirable results of delayed speech recovery s social and domestic difficulties, loss of job and psychological eaction and demoralization. (Edward,I974).

4. Historical revie of the surgical shunt operations