AN EXPERIENCE OF PERCUTANEOUS TRACHEOSTOMY IN TWENTY OBESITY PATIENTS WITH SHORT NECK IN A TERTIARY CARE HOSPITAL IN PAKISTAN

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ABSTRACT

Objective: To evaluate the success rate, procedure time and per-operative complications of percutaneous dilational tracheostomy in obese patients with short neck.

Design: Case series, descriptive study.

Place and duration of study: Military Hospital Rawalpindi, from Jan 2006 to July 2007.

Patients and Methods: Twenty obese patients with short neck were referred from intensive care unit (ICU) to operation theatre for open surgical tracheostomy (ST). Before doing open procedure, all the patients were reassessed and an attempt was made by a team of experienced ENT surgeon and anaesthetist, to do percutaneous dilational tracheostomy (PDT) as first option. The success rate, procedure time and per-operative complications were noted. Data was collected over a period of one and half year.

Results: Twenty patients (12 F and 8 M), mean age 53 (34-80) years, mean body mass index (BMI=40) (34-45) were studied. The successful PDT was performed in 18 patients and in two patients procedure was converted to open surgical tracheostomy. Average time taken was 15 min. per-operative complications noted were, false passage, bleeding and leakage of air due to cuff puncture.

Conclusion: In obese patients with short neck, if percutaneous dilational tracheostomy is performed by an experienced operator, in operation theatre (OT) with full preparation, good light and proper positioning, the procedure can be performed with in 15 min, the success rate is high with little complications.

Keywords: Percutaneous dilational tracheostomy, obesity, short neck, open surgical tracheostomy

INTRODUCTION

Almost two third of the tracheostomies are performed on intubated, intensive care unit patients who require prolong ventilatory support due to one reason or other [1]. Early tracheostomy helps patients to wean off the ventilator earlier [2]. Transferring these critically ill patients with all their monitors to the operation theatre (OT) has inherent risks and increases demands on OT time, which is expensive and often in short supply [3]. In the past 50 years, however, several methods of doing percutaneous dilational tracheostomy (PDT) have been introduced. The most popular technique today is the PDT described by Ciaglia in 1985 [4]. This technique uses a single tapered dilator over a guide wire, with or with out fiber optic laryngoscopic guidance. In experienced hands, PDT can be done in 5 to 10 minutes and will rarely require more than 15 minutes [4].

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While this technique is effective and safe, it has some complications. These include puncturing the cuff and transfixing the endotracheal tube (ET) during the transtracheal needle insertion, inserting the guide wire through Murphy, s eye, or accidental extubation while withdrawing the tube during the procedure leading to loss of the airway. Other common compilations are false passage, bleeding, injury to tracheal wall and stomal infection [5-10].

In the obese patient, airway management and tracheostomy have been more difficult. Almost every case scenario that was previously reserved for ST has been successfully managed with PDT, including emergency tracheostomy (previously a relative contraindication), a history of prior tracheostomy, obesity, short neck, coagulopathy, and bleeding diathesis [11,12]. In our institution we have recently started doing PDT in main ICU. Difficult cases are still being done by ENT surgeons and open surgical tracheostomy is the procedure of first choice. As the procedure is new for the department so selection of suitable patients is planned on strict basis and obese patients with short neck are not dealt in ICU and referred to OT for open surgical tracheostomy. We reassessed 20 such patients and along with ENT surgeon first attempt was made to do PDT rather than ST. Data was analyzed and success rate, time of procedure and per-operative complications was noted.

PATIENTS AND METHOD

This case series descriptive study was conducted at military hospital Rawalpindi Pakistan from Jan 2006 to July 2007.

Twenty obese patients were examined by ENT surgeon in ICU and scheduled for ST in the operating room. All the cases were reassessed by a team of ENT surgeon and anaesthetist who had good experience of doing PDT. And it was planned that first attempt for PDT will be tried with full preparation of open surgical tracheostomy. ET tube was pulled up to cord level. Proper anaesthesia was maintained with Propofol infusion, muscle relaxation with atracurium and 50% O2 plus 50% NO2 and 1% isoflurane. Patient was ventilated with anaesthesia ventilator at respiratory rate 10 breath/min, tidal volume 10 ml/kg and I/E ratio 1:2. All necessary monitoring like pulse oximetry, capnograghy, blood pressure, ECG was applied. The neck was cleaned with antiseptic solution and properly draped. The cricoid cartilage was identified, and the skin was anaesthetized with 1% lignocaine with 1: 100,000 adrenaline below the cricoid cartilage. A 1.5 to 2-cm transverse skin incision was made at the level of the first or second tracheal rings. A 22-gauge needle was inserted between the first and second or the second and third tracheal rings (Fig-1). When air was aspirated into the syringe, the guide wire was introduced (Fig-2). After the guide wire was protected, the dilator was introduced (Fig-3). The tracheotomy tube then was introduced along the dilator and guide wire (Fig-4). The guide wire and dilator were removed, the cuff of the tracheostomy tube was inflated, and the breathing circuit was connected. The ET tube was removed.

RESULTS

We selected 20 referred cases from ICU, declared as difficult cases for PDT due to short neck and obesity. Female to male ratio was 3: 2, mean age was 53 years, ranging from 34 to 80 years. Mean BMI was 40 kg/m 2, minimum BMI was 33 kg/m2 and maximum was 46 kg/m2. Ten patients were moderately obese (BMI >34) and 10 were morbid obese (BMI > 40). Indications for ventilatory support were as shown in the (Table).

The procedure was done successfully in 18 (90%) patients, in two (10%) patients it was abandoned and open ST was performed by ENT surgeon. In one moderately obese patient a case of Myasthenia Gravis as the dilator was introduced bleeding started from the wound, pressure applied to stop the bleeding and patient was handed over to ENT surgeon for ST. In second morbidly obese patient of CVA, tracheal rings and cricoid cartilage was hardly palpable. Anyhow attempt for PDT was made but we felt

difficulty in locating the trachea, so procedure was converted to open ST.

In other morbidly obese lady (BMI 45) of acute respiratory distress syndrome (ARDS) first attempt was unsuccessful and dilator was introduced into false passage. Second attempt was successful. In other two patients as the needle was introduced it punctured the cuff of ET tube, resulting in leakage of air, throat was packed and procedure restarted.

The mean time taken during the procedure was 14.67 millions. As complications were more common in morbidly obese patient, they took longer time than other moderately and mildly obese patients.

DISCUSSION

Although PDT has replaced open ST in most of the centers, still open ST has got its place to deal the difficult cases like obese patients with short neck. These difficult cases can be dealt in operating room where all the facilities of good light, better positioning facilities and ENT team is available for rescue. Although in advanced centers even open ST are being performed in ICU, by ENT surgeons but in our set up ICUs are not well staffed and equipped so surgeons are afraid of doing such procedure in ICU where as they feel at home while operating in main OT [11,12].

The status of PDT has undergone several ups and downs in many institutions. It is

Table: Indicators of ventilatory support.

Sex	Age Year	BMI kg/m²	Diagnosis	Complications	Procedure Time(Min)
F	40	41	Myasthenia Gravis	Nil	15
F	44	43	ARDS	Nil	13
M	34	41	GB Syndrome	Cuff puncture	18
M	37	41	Acute lung injury	Nil	15
M	61	36	ARDS	Nil	13
M	59	38	ARDS	Nil	14
F	42	38	Septicaemia	Cuff puncture	18
F	44	40	GB Syndrome	Nil	15
F	54	41	Myasthenia Gravis	Bleeding	Converted to ST
F	56	43	CVA	Nil	16
M	69	37	ARDS	Nil	13
M	71	39	Blast Injury	Nil	16
F	33	43	GB Syndrome	Difficult to locate trach	Converted to ST
F	35	45	ARDS	Nil	13
M	79	33	CVA	Nil	12
M	80	35	Blast Injury	Nil	14
F	44	44	ARDS	False passage	19
F	46	46	COPD	Nil	15
F	65	37	CVA	Nil	12
F	67	38	COPD	Nil	13

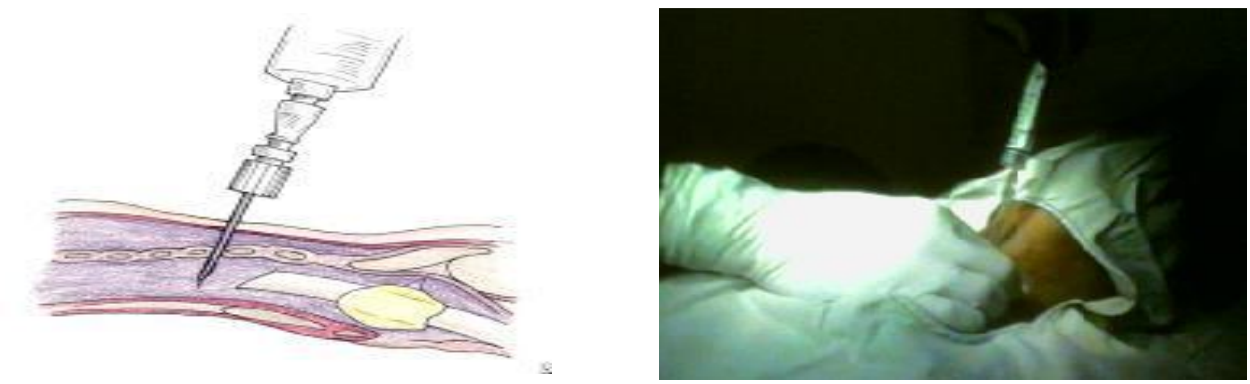

Fig. 1: A 22-gange needle was inserted between first and 2nd tracheal rings.

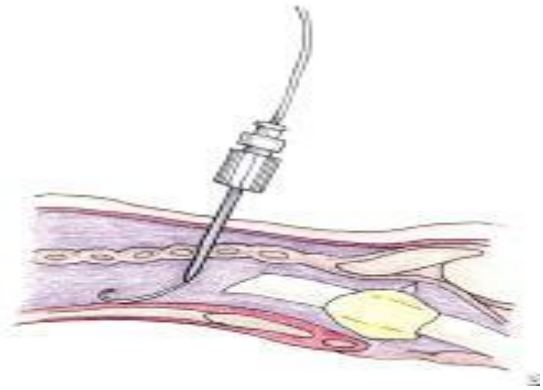

Fig. 2: Guide wire is being introduced.

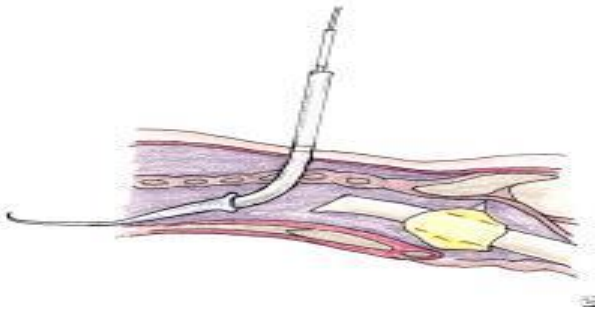

Fig. 3: After the guide wire, a dilator is introduced.

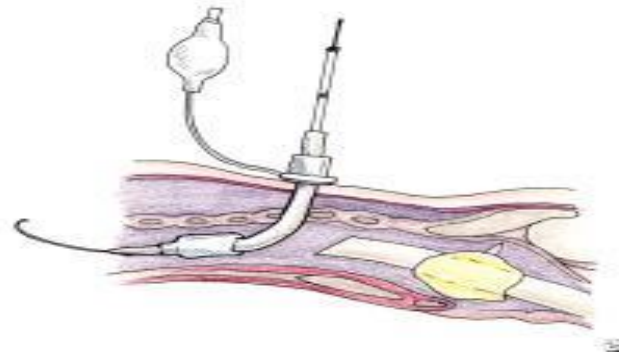

Fig. 4: The tracheostomy tube was introduced along the dilator.

common to see initial zest as PDT is introduced followed by dismay at unacceptably high complication rates; then it is replaced by ST. Often the high complication rates reflect inadequate training and lack of familiarity with the technique, especially during the learning curve. Expertise in ST does not necessarily confer safety and expertise in PDT. Therefore training is essential even for experienced surgeons. Ideally today's surgical trainees need training in both ST and PDT. The ability to convert a percutaneous method to an open surgical procedure if needed has always been an advantage that surgeons have over non-surgeons [5, 11, 12].

A retrospective analysis was performed of all PDT done in Royal Glamorgan Hospital, during two years period from July 1999 to July 2001, to assess whether PDT is a feasible option as first line procedure in all elective tracheostomies. Out of 36 patients operated bleeding was noted to be problem in only one patient, as is the case in our study that shows this is a rare complication as compared to open ST, considering PDT a safe procedure.

Short coming in our study was that the number of patients was less but they were technically difficult to operate due to short neck and obesity [13].

Although post operative complications are less after PDT as compared to ST but per operative complications are more common in case of PDT and especially in morbid obese patients. These complications can be further lessened if the PDT is done under light guided fibro scope [14].

Tracheostomy is done mostly in critically ill patients, many of whom do not survive. This makes it difficult to study its long term complications. We still do not know the long term complication rates of open surgical tracheostomy itself notably tracheal and subglottic stenosis, tracheomalacia and infection. A confounding factor in assessing these complications is the possible airway injury caused by translaryngeal intubation usually done before the tracheostomy. No study has attempted to define these complications and prospectively study long term survivors after tracheostomy. Using bronchoscopy to guide PDT provides the advantage of visualizing and recording tracheal mucosal injury, tracheal wall abnormalities, and vocal cord and subglottic injury present prior to tracheostomy. Documenting these may be useful in the prospective evaluation of long term complications [4,15].

Naresh D et al performed bedside PDT in 13 obese patient, resulting in false passage in one patient and cuff puncture in one patient and concluded that PDT can be safely performed in ICU and it is no more a contraindication to PDT which was previously thought [15] Any how in comparison to normal patients certainly peri-operative complications are more common in obese patients [16].

In thin lean patients this procedure can be performed with in 10 min but obese patients with short neck are technically difficult and may take more time but not more than 15 min. Except in cases of per operative minor complications like false passage it may exceed 17 min [4,16].

CONCLUSION

Obesity in these modern days is no more a contraindication to PDT. Anyhow if the procedure is performed in OT where facilities of good light, better positioning and other surgical aids are readily available, the success rate is high with relatively few minor complications. This procedure is less traumatic and should be performed as first choice.

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