

Original Research Article

Management of Thyroid Isthmus During Tracheostomy

Adil Hadi Salih Al-Azzawi Wissam Kadhum Abdel Amer*
Ahmed Kareem Shiaan Al-Baidhani
Al-Hilla General Teaching Hospital, Hilla, IRAQ

*E-mail: wisamalsady@yahoo.com

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Abstract

A tracheotomy is a surgical procedure which consists of making an incision on the anterior aspect of the neck and opening a direct airway through an incision in the trachea (windpipe). As with any surgery, there are some risks associated with tracheotomies. Early Complications that may arise during the tracheostomy procedure or soon thereafter include bleeding, pneumothorax, and subcutaneous emphysema. The aim of this study was to evaluate the use of cautery knife instead of artery forceps in management of thyroid isthmus during tracheostomy with regard to time of operation, post-operative bleeding, and surgical emphysema.

This study was a cross-sectional research performed on 60 ICU patients in need of tracheostomy through a period started from January 2009 to January 2012. The patients were divided into two groups each formed of 30 patients, one group (group A) dealt with by traditional tracheostomy through clamping of the thyroid by artery forceps and transfixion to expose tracheal rings, and second group (group B) had a new method of management through cautery knife. Time of both procedures and early complications were registered in questionnaires and the data were analyzed for both groups.

A tracheostomy was performed in 60 morbidly ICU patients. The two groups had no significant difference in age, sex, and vital signs. Average duration of the procedure was 10-20 minutes in group A patients using the traditional procedure and 5-10 minutes in the second group (group B) using a cautery knife. Three patients out of thirty in group A got post-operative bleeding, while no patient in group B got bleeding. There was a significant difference between the two groups regarding time of procedure and post-operative bleeding, otherwise there was no significant differences between the two groups regarding occurrence of surgical emphysema. The use of cautery knife for thyroid isthmus management during tracheostomy minimize operation time and reduce occurrence of postoperative complication especially bleeding.

Key words: Tracheostomy, cautery knife, ENT.

الخلاصة

عملية قص القصبة هو إجراء العمليات جراحية التي تتألف من إجراء شق على الجانب الأمامي من الرقبة وفتح مجرى الهواء مباشرة من خلال شق في القصبة الهوائية. كما هو الحال مع أي عملية جراحية، وهناك بعض المخاطر المرتبطة بعملية قص القصبة وتشمل المضاعفات المبكرة التي قد تنشأ أثناء إجراء القصبة الهوائية أو قريباً بعد ذلك النزيف واسترواح الصدر، وانتفاخ تحت الجلد. وكان الهدف من هذه الدراسة تقييم استخدام سكين الكي بدلاً من الملقط الشرياني في إدارة برزخ الغدة الدرقية خلال عملية قص القصبة الهوائية فيما يتعلق بوقت العملية والنزيف، وانتفاخ الرئة الجراحي. هذه الدراسة كانت دراسة بحثية مقطعية أجريت على 60 مريض في وحدة العناية المركزة من المرضى الذين يحتاجون إلى عملية قص القصبة الهوائية خلال فترة بدأت من يناير 2009 إلى يناير 2012. تم تقسيم المرضى إلى مجموعتين كل منها مكونة من 30 مريضاً، مجموعة واحدة (المجموعة ألف) تعالج بالقصبة الهوائية التقليدية عن طريق لقط الغدة الدرقية بالملقط الشرياني وقطو التثبيت لفضح حلقات القصبة الهوائية، والمجموعة الثانية (المجموعة ب) أسلوب جديد للإدارة العملية عن طريق سكين الكي. تم تسجيل وقت الإجراءات والمضاعفات المبكرة في الاستبيانات وتم تحليل البيانات لكل من المجموعتين.

عملية قص القصبة الهوائية قد أنجز في 60 مريض في العناية المركزة. وفي كلا الفريقين لا يوجد فرق كبير في العمر، والجنس، والعلامات الحيوية. وكان متوسط مدة الإجراء 10-20 دقيقة في مرضى المجموعة الأولى باستخدام الإجراءات التقليدية و 5-10 دقائق في المجموعة الثانية (المجموعة ب) باستخدام سكين الكي. حصلت ثلاثة مرضى من أصل ثلاثين في المجموعة أ النزيف بعد العمليات الجراحية، بينما لن يحصل نزيف لأي مريض

في المجموعة ب. كان هناك فرق كبير بين المجموعتين فيما يتعلق بالوقت الداخلي والتنظيف بعد العمليات الجراحية، ولم يكن هناك اختلافات كبيرة بين المجموعتين فيما يتعلق بالتواجد لانثقاح الرئة الجراحي. استخدام سكين الكي لإدارة برزخ الغدة الدرقية خلال عملية قص القصبة الهوائية تقلل وقت عملية القصبة الهوائية وتحدد من حدوث مضاعفات بعد العملية الجراحية لاسيما التنظيف.

الكلمات المفتاحية: عملية قص القصبة الهوائية، سكين الكي، الآنف والحنجرة.

Introduction

Tracheotomy has been done since 1500 BC and is one of the first-born conveyed surgical procedures in the medical works. It is a surgical procedure which involves making a vertical or transverse incision on the anterior surface of the neck and opening a direct airway through an incision in the anterior wall of trachea. The consequential hole, or tracheostomy, can function independently as an airway or as a site for a tracheostomy tube (metallic or portex) to be inserted; this tube allows a person to breathe directly [1,2]. The postoperative care of tracheostomized patients experiencing this procedure is understated. The safety of existing practice patterns in tracheostomy management is poorly distinct [3].

Tracheotomies are indicated for upper airway obstruction (stridor or streator), extended endotracheal intubation and airway protection from aspiration or airway maintenance. The traditional tracheotomy approach has been attended by percutaneous dilatational techniques in nominated patients, particularly in intensive care units (ICUs) [2,4]. Tracheotomies can be performed in the theater or at the bedside in an ICU and can be done by various specialists including ear, nose and throat (ENT) surgeons, fasciomaxillary surgeons, general surgeons and thoracic surgeons [5].

As with any procedure, a tracheostomy can result in complications. Some of them are more likely to occur shortly after the surgery is done. Other complications are more likely to occur later [6]. Complications that can occur shortly after surgery include hemorrhage, pneumothorax, and surgical emphysema [7,8].

There is slight objective comparative evidence about the postoperative complications and morbidity of

tracheostomy procedure [9]. Special techniques and operative strategies must be well applied to overcome serious life-threatening complications from traditional tracheostomy [10,11].

Materials and Methods

This study was a cross-sectional research performed on 60 ICU patients in need of tracheostomy through a period started from January 2009 to January 2012. Our study population was derived from those attending the ICU of the General Teaching Hospital in Hilla city Babylon Iraq who underwent tracheostomy, the procedures were performed under general anesthesia in the operating room or bedside of ICU. The patients were divided into two groups each formed of 30 patients, one group (group A) dealt with by traditional tracheostomy through clamping of the thyroid by artery forceps and transfixion to expose tracheal rings, and second group (group B) had a new method of management through cautery knife.

Data collected were comprised of age, gender, admission diagnosis, indication of tracheostomy, time of procedure and early complications were registered in questionnaires and the data were analyzed for both groups.

Results and Discussion

During a three years period of study a tracheostomy was performed in 60 morbidly ICU patients. Study population was divided into two groups matched in number, age and gender regarding the technique used in their tracheostomy. Time of procedure, early post-operative complications including bleeding and emphysema were registered for all patients.

In this study it was found that there was a significant difference ($P < 0.5$) between the

average time of the two study procedures between the two groups as that the average duration of tracheostomy was 10-20 minutes in group A patients using the traditional procedure of forceps artery for transfixion

of thyroid isthmus, while the average time of procedure was 5-10 minutes among group B patients using a cautery knife as illustrated in table (1).

Table1

	Group A	Group B
Time of surgery	10-20 min.	5-10 min.
Post-operative bleeding	3	0
Surgical emphysema	1	1

Regarding the occurrence of post-operative bleeding, there was a significant difference ($P < 0.5$) between the two groups of study, three patients out of thirty in group A got post-operative bleeding, while no one in group B got bleeding as presented in table (1). Otherwise there was no significant differences between the two groups regarding occurrence of surgical emphysema, both groups population had the same chance of getting surgical emphysema throughout the study period.

Tracheotomy is a common procedure in intensive care units, and surgeons must provide proper care to tracheostomy patients to prevent complications. Tracheostomy emergencies include hemorrhage, tube dislodgement and loss of airway, and tube obstruction; such emergencies are managed more effectively when providing proper strategies for preventing complications, and management of tracheostomy emergencies [5]. Our results regarding time of surgery in using new techniques for tracheostomy came in line with other studies [5,12] predicting that time of surgery is one of the principal elements for diminishing post-operative complications for any surgery.

Tracheostomy continues to be the standard procedure for management of long-term ventilator-dependent patients. Numerous publications have reported on the safety and complications of traditional tracheostomy

compared to new techniques in management of thyroid isthmus during tracheostomy in critically ill ICU patients. Minor bleeding was the most frequently reported complication [6,7], the incidence of post-operative bleeding in the present study was found to be significantly different between the two groups, three patients in groups A had bleeding attack during and shortly after the surgery while none of group B got bleeding. This result came harmonized with other studies [8, 11,12], applying a focus on avoidance of catastrophic sequelae, through adoption of special techniques and operative policies.

Conclusion

Our results conclude that the use of cautery knife for thyroid isthmus management during tracheostomy can minimize operation time and reduce occurrence of postoperative complication especially bleeding.

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