University of the Western Cape
Faculty of Dentistry
Department of Maxillo-Facial and Oral Surgery

Efficacy of two different types of throat packs

Researcher: **E Parker**

May 2009

"In the arena of human life the honours and rewards fall to those who show their good qualities"……..Aristotle

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EFFICACY OF TWO DIFFERENT TYPES OF THROAT PACKS

EBRAHIM PARKER

A mini-thesis submitted in partial fulfilment of the requirements for the degree of Magister Chirurgiae Dentium in the Department of Maxillo-facial and Oral Surgery at the University of the Western Cape

May 2009

DECLARATION

I declare that the study entitled "*Efficacy of two different types of throat packs"* is my own work, that this has not been submitted for any degree or examination in any other university, and that the sources I have used or quoted have been indicated and acknowledged by complete references.

Ebrahim Parker May 2009

…….

ACKNOWLEDGEMENTS

My sincerest gratitude to Prof J.A. Morkel, my supervisor and mentor. I thank you for your patience, encouragement and guidance during this study and throughout this course. It was a great pleasure and honour to serve as an apprentice under a veteran as you. As a result of your trust, commitment and confidence I find myself nearing the end of this great journey.

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ABSTRACT

Post-operative sore throat is a common minor complication following general anaesthesia via endotracheal intubation. Pharyngeal packing has often been implicated in this minor anaesthetic complication. In maxillo-facial and oral surgery, two types of throat packs are commonly used namely ribbon gauze and tampons. In order to establish the efficacy of these two types of throat packs a prospective, randomised, clinical study was conducted. The objectives of the study were threefold: to investigate the effect of the two different types of throat packs on the incidence of post-operative sore throat, to determine the quality of seal provided by the two different types of throat packs and finally, to formulate a faculty protocol.

The study consisted of 70 patients undergoing third molar surgery. All the patients were intubated via endotracheal intubation and had a throat pack placed. Patients were also randomly selected and allocated to two groups. One group had ribbon gauze while the other group had a tampon as a throat pack.

The study reflected no statistically significant difference in the incidence of post-operative sore throat between the two groups. It was interesting to note that the symptoms of sore throat resolved quicker with the use of tampons. On the other hand, the ribbon gauze provided a better pharyngeal seal.

KEYWORDS

General Anaesthesia

Throat packs

Lil-lets®

Ribbon gauze

Pharyngeal packing

Post-operative sore throat

Maxillo-facial and oral surgery

Complications

CHAPTER ONE - INTRODUCTION

In South Africa, general anaesthesia is still commonly used in third molar surgery. General anaesthesia has many purposes including pain relief (analgesia), blocking memory of the procedure (amnesia), producing unconsciousness, inhibiting normal body reflexes to make surgery safe and easier to perform, and relaxing the muscles of the body.

Inhalational techniques are commonly employed and the agents are usually delivered nasally or orally. In these patients the use of a throat pack is considered advisable, but a pack is frequently a matter of compromise. It should provide a physical barrier to fluids and solids from entering the aero digestive passages. Yet it must not interfere with the maintenance of a good airway, be an obstruction with regard to surgery or accidently be left *in situ* after surgery.

The use of throat packs has its own complications. They are known not to offer complete protection to aspiration (Vickery and Burton, 1977). The scientific literature reflects that trauma caused by pharyngeal pack placement has also been associated with post-operative sore throat (Conway *et al*., 1960; Fine *et al*., 1988). Documented injury to the pharyngeal plexus (Mermar *et al*., 1990) and even severe post-operative swelling of the tongue has been attributed to the use of throat packs (Kawaguchi *et al*., 1990). In addition to this, pharyngeal packs have inadvertently been left in place

following extubation, which could potentially lead to serious post-operative complications (Sexton and Dohlman, 1989; Knepil and Blackburn, 2008).

Various materials have been used for throat packs, namely, ribbon gauze, tampons, bandage rolls, Raytex® swabs, tapered sponges, and pharyngeal foam packs.

CHAPTER TWO - LITERATURE REVIEW

Sore throat is a common post-operative compliant after endotracheal intubation. Furthermore, in most cases post-operative throat complaints resolve spontaneously without specific treatment (McHardy and Chung, 1999). Sore throat is often a critical factor in the patients' satisfaction ratings after general anaesthesia.

The incidence of sore throat after tracheal intubation varies in the literature. Conway *et al*. (1960) reported a 61% incidence in post-operative sore throat compared to a 14.4% reported by Christensen *et al*. (1994). Aetiological factors relating to this minor anaesthetic complication include the size of the endotrachal tube, design and pressure of the cuff, lack of airway humidity, trauma associated with airway insertion and the use of nasogastric tubes, lubricants, muscle relaxants and throat packs (Tay *et al*., 2001).

The association between post-operative sore throat and the area of contact between the tube cuff and the throat has been investigated by Jensen *et al*. (1982) and Loeser *et al*. (1980). They both found that low volume high pressure cuffs induces less post-operative sore throat compared to high volume low pressure cuffs.

The size of the tracheal tube has been shown to be related to the incidence of post-operative sore throat (Loeser *et al*., 1980). The use of smaller tracheal tubes with cuffs

which have a smaller area of contact with the tracheal mucosa has been noted to reduce the incidence of post-operative sore throat (McHardy and Chung, 1999).

McHardy and Chung (1999) in their review article discussed the causes and prevention of post-operative sore throat. They noted that these common complications are associated with trauma to the larynx and the pharynx. They stressed that careful airway management technique is essential and appropriate sizes of tracheal tube and laryngeal mask should be chosen.

Anaesthetic technique and amount of trauma caused during intubation have also been discussed in the literature. Possible factors responsible for difficult intubations and possible subsequent throat trauma, as discussed by Conway *et al*. (1960), are a bull neck, prominent incisor teeth, a stiff neck and laryngeal and masseteric spasm.

Lubricating agents are often applied to the distal tip of the endotracheal tube as it is believed that these agents may limit potential damage to the tracheal mucosa by suppressing coughing or buckling of the tube (Stride, 1990). The effects of various lubricating agents have also been investigated with varying results. Lubricating agents commonly used include water soluble jelly (e.g. K-Y jelly®), lidocaine jelly (e.g. Xylocaine® 2% jelly) and hydrocortisone cream or gel.

The idea of using a topical steroid to prevent post-operative sore throat is not new and was suggested as early as 1958 (Hamelberg, *et al*). They studied the effects of applying lignocaine ointment that contained 1% hydrocortisone to tracheal tubes before their insertion. They noted a decrease in the incidence of post-operative sore throat. Sumathi *et al*. (2008) in a randomized, double blind, controlled study investigated the incidence of post-operative sore throat, cough and voice hoarseness after endotracheal intubation when applying betamethasone gel or lidocaine jelly on the tracheal tube. They found that betamethasone gel (0.05%) effectively reduced the incidence of post-operative sore throat compared to the lidocaine jelly (2%

Xylocaine®). Their results were similar to those published by Ayoub *et al*. (1998) and Selvarage and Dhanpal (2002).

Conversely, Stride (1990) concluded that the application of 1% hydrocortisone cream to the distal tip of the tracheal tube was ineffective in prevention of post-operative sore throat. In their study of 40 patients, undergoing elective surgical procedures, the tracheal tubes of one group was lubricated with 1% hydrocortisone cream while the tracheal tubes of the other group was lubricated with K-Y jelly®.

Maruyama *et al*. (2004) in their study of 418 patients undergoing elective surgical procedures found that the application of lidocaine spray was associated with an increased incidence of post-operative sore throat. In their study patients were divided into four groups. In group one, K-Y jelly® was used as the cuff lubricant and lidocaine spray (8% Xylocaine® spray) was applied to the larynx before intubation. In group two, K-Y jelly® was used as the cuff lubricant but lidocaine spray was not applied. In group three, lidocaine jelly (2% Xylocaine® jelly) was used as the cuff lubricant and lidocaine spray (8% Xylocaine®) was applied before intubation. In group four, lidocaine jelly was used as the cuff lubricant but lidocaine spray was not applied.

The placement of protective throat packs following endotracheal intubation is commonly used in oral surgery and otolaryngology. Their function is to prevent aspiration, pharyngeal and tracheal contamination and the passage of blood into the stomach.

Various materials have been used as a throat pack including ribbon gauze, tampons, bandage roll, Raytex® swabs, tapered sponge and pharyngeal foam packs made from polyurethane.

In addition to this, various shapes and sizes of throat packs have also been marketed, with each manufacturer claiming their product to be the ultimate pharyngeal pack. However, there are no clinical trials in the literature on the efficacy of these custom made throat packs. The cost of these custom packs may also make them impractical, especially if cheaper alternatives are available which are able to perform the same function with the same efficacy.

Two types of throat packs are commonly used in maxillo-facial and oral surgery, namely, ribbon gauze (fig.1) and tampons (fig.2). The ribbon gauze is often soaked in saline prior to placement whereas the tampon is inserted dry.

Figure 1

Ribbon gauze

(non-moistened)

Figure 2

Tampon

The influence of pharyngeal packing on the incidence of sore throat has been investigated previously with varying results.

Conway *et al*. (1960) looked at the incidence of sore throat after anaesthesia and some of its causes. They found that placement of a throat pack (moistened ribbon gauze) was associated with a 61% incidence of post-operative sore throat.

Griffiths *et al*. (1973) undertook a study to asses the incidence of post-operative sore throat and to determine which of the three commonly used throat packs produced the lowest incidence of this complication, in patients undergoing surgical removal of impacted third molars. The three types of throat packs compared were gauze soaked in sterile saline, gauze soaked in Vaseline® (petroleum jelly) and autoclaved, and tampons soaked in sterile saline. They found that pharyngeal packing increased the

incidence of post-operative sore throat. Their study failed to show an increased incidence of post-operative sore throat associated with any one particular throat pack.

Fine *et al*. (1988) found that insertion of pharyngeal packs were associated with a high incidence of post-operative sore throat. Their study was conducted amongst patients undergoing surgical removal of impacted third molars after endotracheal intubation. They found that 80% of patients who had throat packs inserted experienced post-operative sore throat compared to none of the patients who had no throat pack insertion.

Marais and Prescott (1993) conducted a blind, randomised, controlled trial to compare throat pain in patients who received pharyngeal gauze packs, pharyngeal tampons or just intubation without pharyngeal packing. Their study was carried out on patients undergoing routine nasal surgery. Throat pain was measured twice, 6 hours and 24 hours post-operatively by direct questioning and scored on an author devised Likert scale. This scale grouped responses into: no pain, mild pain, moderate pain or severe pain. They found that pharyngeal packing exacerbated post-operative sore throat. Furthermore they found that the use of tampons is associated with a lower incidence (15%) of post-operative sore throat compared to the use of gauze (36%).

Elhakim *et al*. (2000) experimented with throat packs soaked with the hydrophilic, non-steroidal anti-inflammatory drug (NSAID), Tenoxicam®, to reduce post-operative sore throat discomfort. They compared the prevalence of post-operative sore throat

following the use of Tenoxicam®-soaked and saline-soaked swabs in 80 patients undergoing nasal surgery, within a randomised, controlled trial setting. Post-operative sore throat was measured between 12 and 24 hours after the procedure. Elhakim and colleagues found that 40 % of patients with saline-soaked throat packs reported throat pain, compared with 10 % of those with Tenoxicam®-soaked packs.

A randomized clinical trial to investigate the effect of pharyngeal packing after endotracheal anaesthesia, on the incidence of post-operative sore throat in patients undergoing surgical removal of impacted third molars, was conducted by Tay *et al*. (2001). Patients were randomly assigned in one of two groups; one group had no pharyngeal packing whereas the second group had gauze soaked in sterile saline inserted as a throat pack. All patients were interviewed immediately after recovery and 24 hours post surgery. They found no significant differences in the incidence or severity of sore throat post-operatively in the two groups. Thus, the authors concluded that the incidence and severity of post-operative sore throat after endotracheal intubation are not influenced by the insertion of a throat pack.

Basha *et al*. (2006) looked at the effect of pharyngeal packing on the incidence of post-operative sore throat in patients undergoing nasal surgery in a randomized, control trial. Patients were randomly assigned in one of two groups; one group had no pharyngeal packing whereas the second group had saline soaked green ribbon gauze as a throat pack. Post-operative sore throat was measured on a visual analogue scale from 0 to 10. This was done at the following times: immediately post surgery in the

recovery room, two hours and six hours, post surgery and at the time of discharge, approximately 24 hours later. They found that immediately post surgery the incidence of post-operative sore throat was twice as high in the group that had a pharyngeal pack compared to the group that had no pack, but over time the severity of the throat pain decreased. They concluded that pharyngeal packing increases the incidence of post-operative sore throat.

Piltcher *et al*. (2007) carried out a randomized clinical trial to investigate post-operative sore throat after pharyngeal packing in patients undergoing nasal and sinus surgery. The intervention group was submitted to pharyngeal packing after endotracheal intubation, while the control group had no pharyngeal packing. The throat pack consisted of two damp gauzes joined at one of its extremities by a knot plus a tampon. The tampon was placed by the anaesthetist under direct vision in such a way that the gauzes were positioned on both sides of the endotracheal tube, and the knot on the midline next to the uvula. Their findings were that post-operative sore throat occurred with a similar incidence in both groups, being noted as 38% in the intervention group and 46% in the control group.

CHAPTER THREE - AIMS AND OBJECTIVES

Aim of the study

To evaluate the efficacy of two different types of throat packs used in general anaesthesia during third molar surgery.

Objectives of the study

1. To investigate the effect of two different types of throat packs on the incidence of post-operative sore throat
2. To determine the quality of seal provided by the two different types of throat packs
3. To formulate a faculty protocol

Null hypothesis

There will be no difference in the two different throat packs used during third molar surgery.

CHAPTER FOUR – METHODS AND MATERIALS

Study Design

- A prospective, randomized, double blind study
- Seventy patients requiring general anaesthesia for third molar surgery were selected for this study
- Standardized anaesthetic technique
- Standardized surgical procedure
- Detailed information was recorded on data capture sheets

Study population

The study population comprised of patients requiring removal of third molars selected from the waiting list at the Department of Maxillo-Facial and Oral Surgery at Tygerberg Oral Health Centre, UWC.

Research Methodology

Seventy patients requiring surgical removal of impacted third molars were divided into two groups.

Group 1 (35 patients) had a standard size ribbon gauze soaked in sterile saline as a throat pack.

Group 2 (35 patients) used one dry tampon (Lil-lets® -extra absorbent type) as a throat pack.

A standardized general anaesthetic protocol with endotracheal intubation was followed. This included:

- Standard anaesthetic drugs and neuromuscular blocker
- Placement of a north facing cuffed naso-tracheal tube
- Placement of throat pack with McGill's forceps under direct vision by the anaesthetist
- Removal of throat pack by anaesthetist with McGill's forceps under direct vision by the anaesthetist
- Pharyngeal toilet under direct vision with soft tip sucker (Yankur) by anaesthetist

A standard surgical procedure, for the removal of impacted third molars was followed. During the procedure, head movement was kept to a minimum.

Inclusion criteria

1- American Society of Anaesthesiologists (ASA) -1 patients

[Healthy individuals of any sex, race and age ranging from 16-35 who had to undergo third molar surgery]

2- Patients with impacted third molars

Exclusion criteria

1- Patients with blood dyscrasias

2- Patients with history of throat problems

3- Patients with rheumatic heart disease

4- Patients with associated third molar pathology

5- Patients using homeopathic or alternative medication for any reason

6- Patients with reduced immunity

7- Mentally challenged patients

Criteria to be evaluated

1. Blood under the pack

Presence of blood on distal end of pack

- Yes
- No

This was evaluated by the anaesthetist on removal of the throat pack.

2. Sore Throat

Post-operative sore throat was graded on a scale of 0 – 3.

0 – No discomfort

1 – Less severe than a cold

2 – Similar to a cold

3 – More severe than a cold

All patients were interviewed two hours after recovery and 24 hours post-operatively by the same interviewer.

Data management and statistical analysis

- All data was collected on a data capture sheet for statistical analysis (Appendix 2)
- Statistical analysis of the data was performed using Microsoft Excel® plus add ins and NCSS®

Ethical Considerations

- This proposal was presented to the Ethical and Research Committee of the University of the Western Cape for approval
- Participation in this study was on a voluntary basis
- Patients were adequately informed about the objective of the trial (Appendix-1a)
- Written informed consent was obtained from every patient (Appendix -1b)
- Patients with any other dental problems were referred to the appropriate departments
- Participants were given the right to withdraw from the study at any stage which would not prejudice them in any manner regarding future treatments
- The rights and anonymity of patients were protected at all times

CHAPTER FIVE - RESULTS

The study consisted of 70 patients, all of whom had surgical removal of impacted third molars under general anaesthesia. All the patients were intubated via endotracheal intubation and had placement of a throat pack. Patients were also randomly selected and placed into one of two groups. One group had ribbon gauze while the other group had a tampon as a throat pack. The duration of operation, age and sex distribution were similar in both groups.

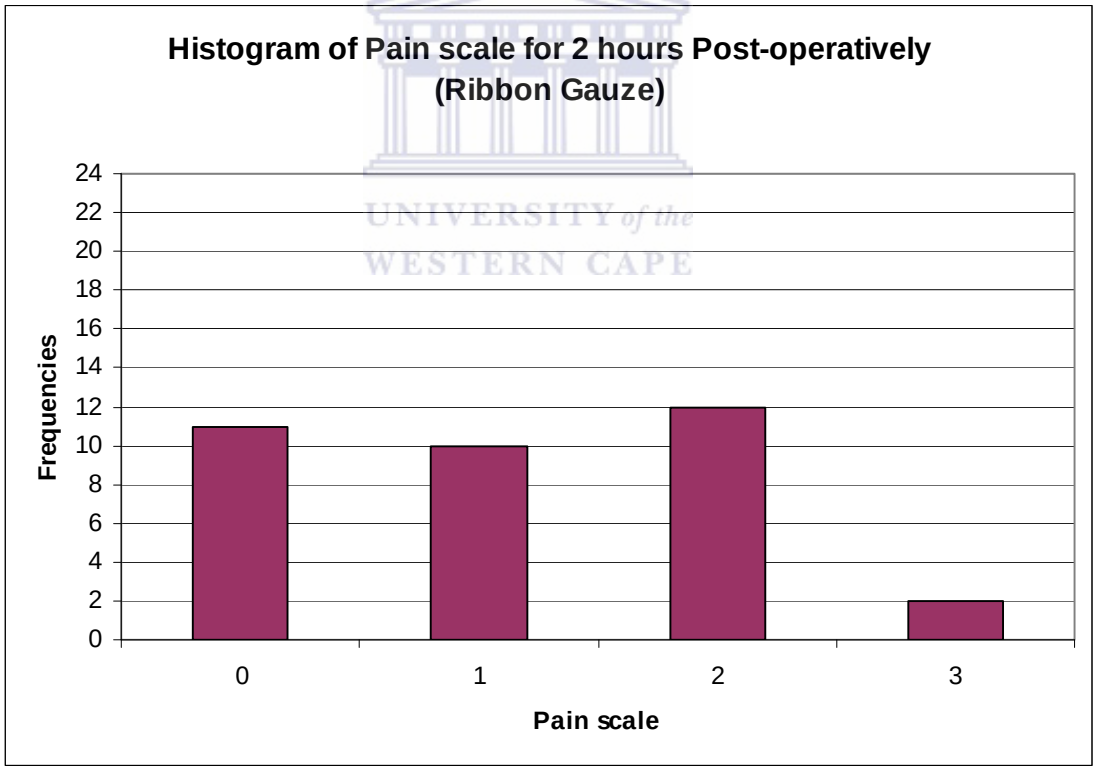

Figure 3

Twenty four out of 35 patients (69%) in the ribbon gauze group complained of throat pain two hours post-operatively. Most of these symptomatic patients (22) were in the "less severe than a cold" and "similar to a cold" groups. Eleven patients (31%) in the ribbon gauze group had no throat pain two hours post-operatively. Only two patients (6%) in the ribbon gauze group actually complained of severe throat pain two hours post-operatively (fig.3).

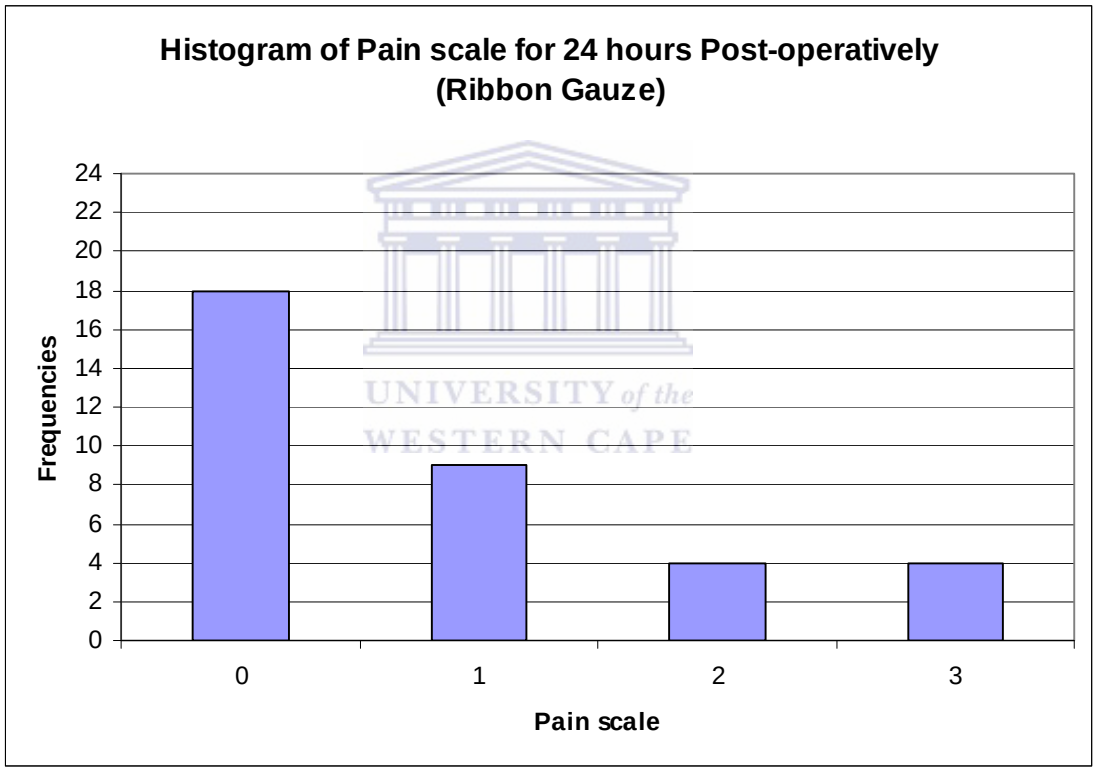

Figure 4

Twenty four hours post-operatively, the majority of patients (18) in the ribbon gauze group had no throat pain. Nine patients (26%) in the ribbon gauze group had mild throat pain while four patients (11%) in the ribbon gauze group complained of severe throat pain 24 hours post-operatively (fig.4).

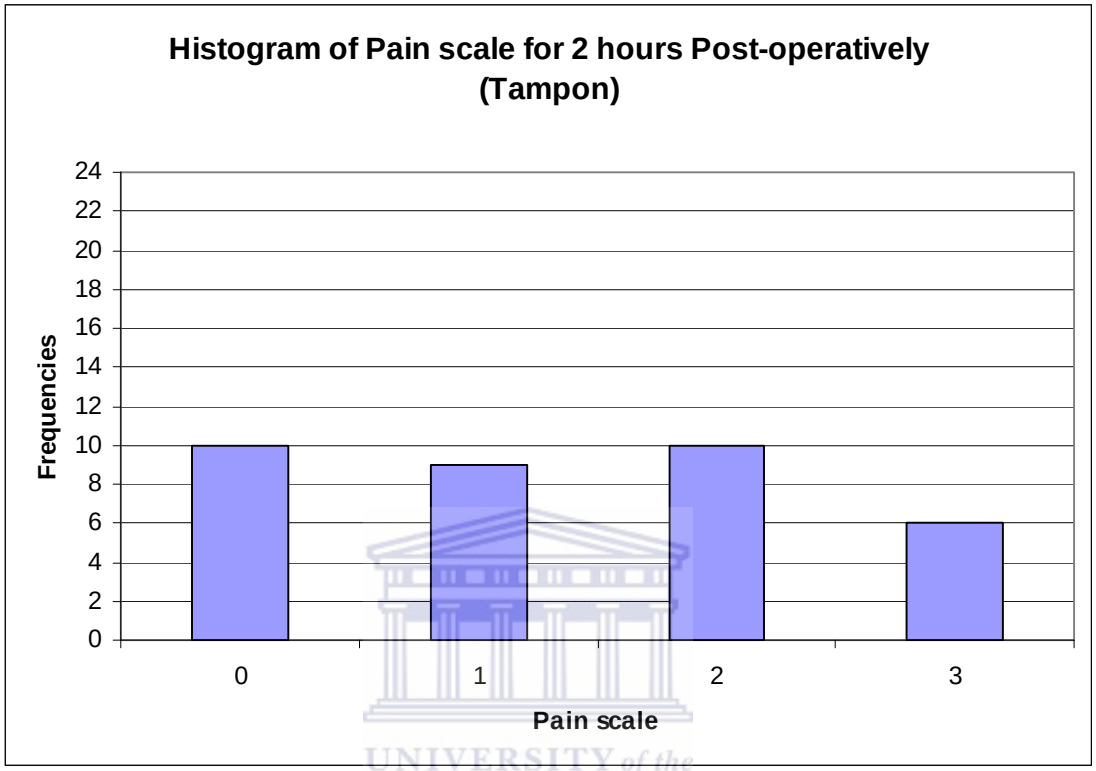

Figure 5

In the tampon group, 25 out of 35 patients (71%) were symptomatic at two hours post-operative. Nineteen of the 25 were in the "less severe than a cold" and "similar to a cold" groups while six patients in the tampon group complained of severe throat pain. Ten patients (29%) in the tampon group had no throat pain two hours post-operatively (fig.5).

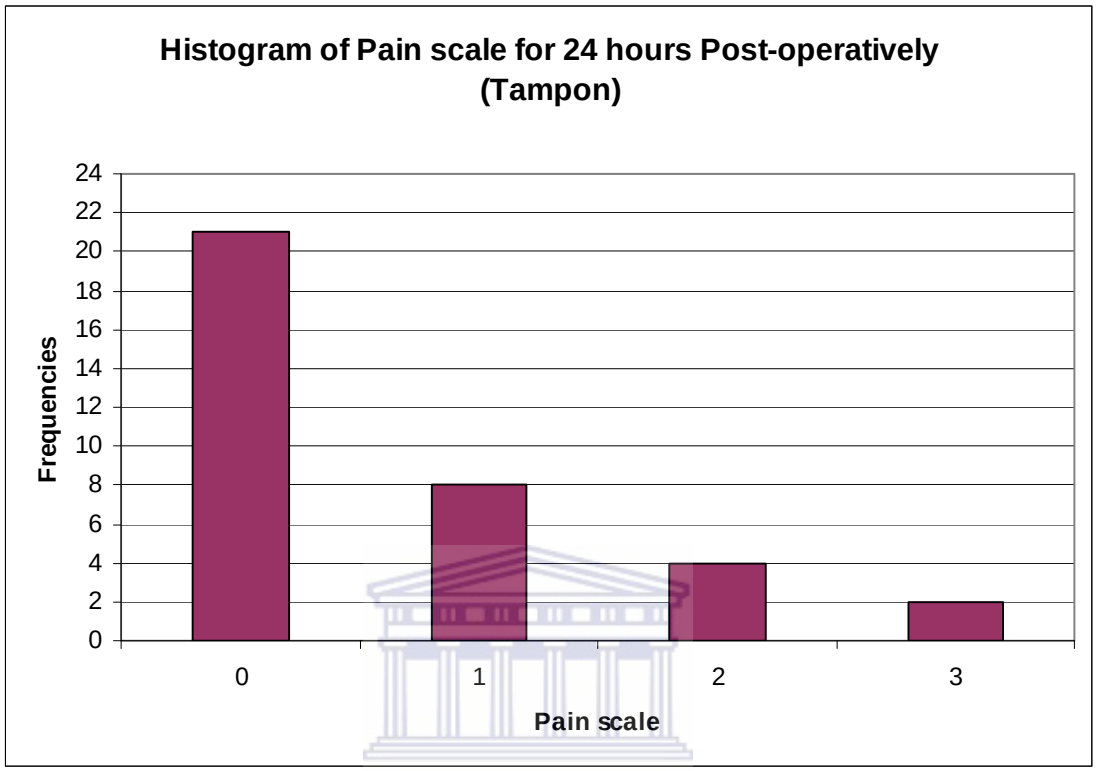

Figure 6

After 24 hours post-operatively, the majority of patients (60%) in the tampon group were symptom free. Twelve patients (34%) in the tampon group still had either "less severe than a cold" or throat pain "similar to a cold" while only two patients (6%) in the tampon group complained of severe throat pain 24 hours post-operatively (fig.6).

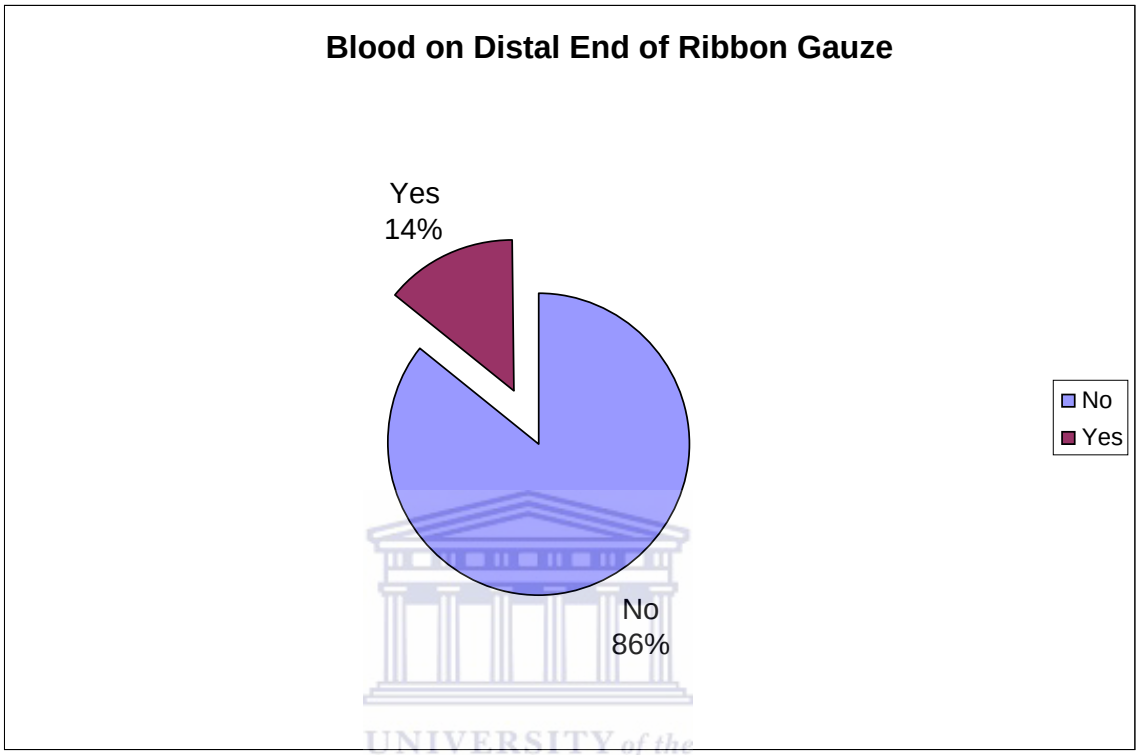

Figure 7

In the analysis of "presence of blood on the distal ends of the packs", only five patients (14%) in the ribbon gauze group had blood on the distal ends compared to 11 patients (31%) in the tampon group (fig.7 & fig.8).

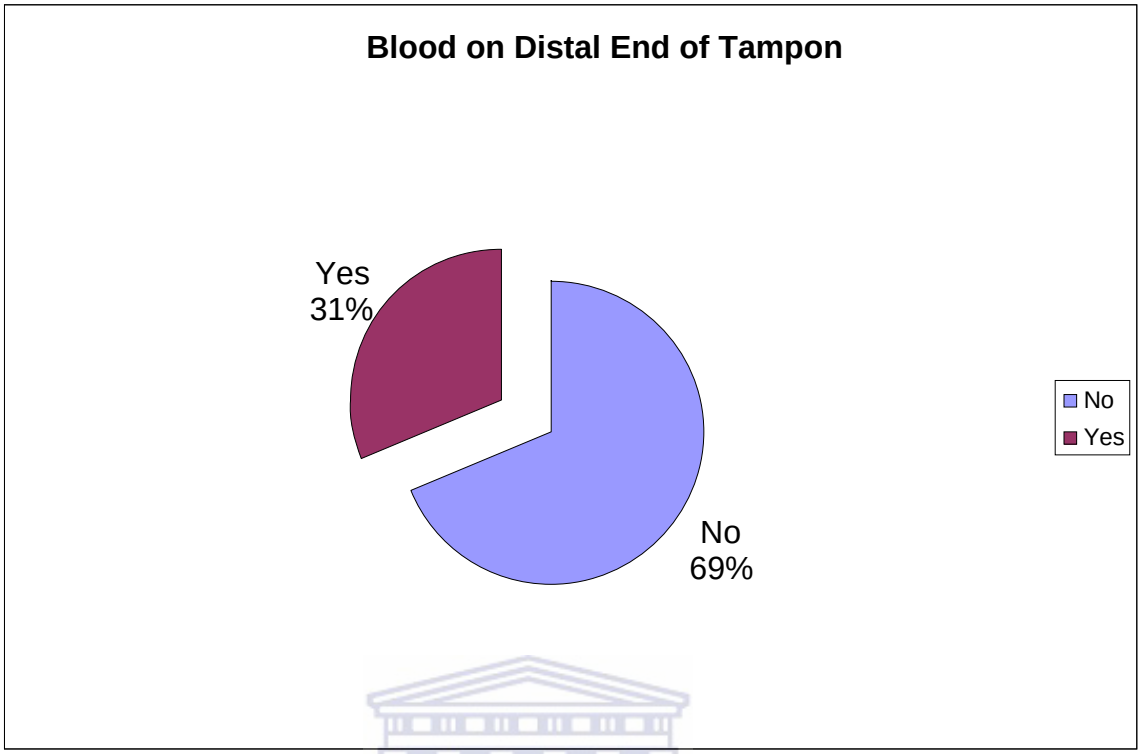

Figure 8

CHAPTER SIX - DISCUSSION

Post-operative sore throat is a common minor anaesthetic complication following endotracheal intubation. Aetiological factors include the use of pharyngeal packs, nasogastric tubes, lubricants, muscle relaxants and local anaesthetics as well as sex of the patient, size of the endotracheal tube and design and pressure of the endotracheal cuff. The use of ribbon gauze and tampons as throat packs in maxillo-facial and oral surgery procedures is common practice in the Western Cape and their efficacies and complications are often debated.

In this study, there was no statistical difference (*p=0.8118*) in the incidence of post-operative sore throat with either type of throat pack used during general anaesthesia, in third molar surgery. These findings are comparable with the results in the studies of Tay *et al*. (2001) and Piltcher *et al*. (2007).

Furthermore it was noted that there was a significant improvement in post-operative sore throat in both the study groups from two hours to 24 hours post-operatively. The tampon group had more superior results in this regard, especially in the “more severe than a cold” symptom group (two versus four patients).

The quality of seal of throat packs is really the main indication for their use in maxillo-facial and oral surgery. In this study, blood was found to be present on the distal tips of packs in five patients (14%) in the ribbon gauze group compared to 11

patients (31%) in the tampon group. Clinically it was found that both ribbon gauze and tampons created an effective clinical seal. There were no clinical blood clots noted beyond the tips of either of the two different packs. It could be postulated that the tampons have inherently a better absorption of blood and saliva which could explain the higher incidence of blood noted on the tips.

CHAPTER SEVEN – CONCLUSION

The study concludes that there is no statistical significant incidence in post-operative sore throat symptoms using either ribbon gauze or tampons as a pharyngeal pack after endotracheal intubation. However, it appears that at 24 hours post-operatively, severe symptoms of sore throat are 50% less with the use of tampons compared to ribbon gauze.

The study also showed that ribbon gauze provided a better pharyngeal seal when the parameter of “blood on the distal end” is analysed. Clinically, both packs provided an adequate seal.

Based on the above facts it would appear that pharyngeal packing with either ribbon gauze or tampons are both clinically acceptable, with each one marginally superior in either seal or symptoms.

The study can therefore not conclude whether ribbon gauze is clinically superior to tampons or vice versa when used as throat packs in third molar surgery. The use of either ribbon gauze or tampons can be recommended.

CHAPTER EIGHT – APPENDICES

Appendix 1a

Department of Maxillofacial and Oral Surgery

Faculty of Dentistry & WHO Oral Health Collaborating Centre

University of the Western Cape

Cape Town

2008

Patient Information Letter

Pasiënt informasie

I, Dr E Parker plan to conduct a clinical study to compare 2 types of throat pack routinely used all over South Africa during the process of general anaesthesia. These packs are routinely used for the purpose to seal the throat so that no fluid can go into the lungs. Both the packs that are going to be tested are regarded as excellent sealers. We would like to find out which of the packs create less irritation and subsequent sore throat: a fact that is currently unclear. Participating in the study will not harm or prejudice you in any way. Participating in the study will definitely benefit future patient.

Ek, Dr E Parker, beplan 'n kliniese studie om die effektiwiteit te evalueer van narkose keelpakke wat roetineweg in Suid Afrika gebruik word. Hierdie keelpakke word roeteweg gebruik om die keel gedurende narkose te seël sodat geen vloeistof vanaf die keel in die longe kan kom nie. Beide die keelpakke wat ons gaan toets word aanvaar as effektief. Ons wil graag evalueer watter van die pakke veroorsaak minder irritasie en dus gevolglike seer keel: 'n feit wat nog nie bepaal is nie. Om deel te neem in die studie, sal u nie nakom nie. Deelname in die studie sal toekomstige pasiënte bevoordeel agv die inwin van nuwe kennis.

Thanking you in anticipation.
Dankie vir u samewerking

Prof J.A.Morkel
Department of Maxillo-Facial & Oral Surgery.
Oral Health Centre Tygerberg

Dr E Parker
Researcher

Appendix-1b

Department of Maxillofacial and Oral Surgery

Faculty of Dentistry& WHO Oral Health Collaborating Centre

University of the Western Cape

Cape Town

2008

Consent form:

I Mr/Miss/Mrs._____Date of birth_____File no: _____

am willing to participate in the above mentioned study. I understand that the study is voluntary. I have been informed of the procedure and of the possible complications which can occur during and after the procedure.

I agree to the administration of general anaesthesia and other measures as discussed that may be necessary for my comfort, safety, and well being.

This study is approved by the Ethical and Research Committee of the University of the Western Cape and participation in this study is on voluntary basis. I am being adequately informed about the objective of the trial. I also know that I have the right to withdraw from the study at any stage which will not prejudice me in way regarding future treatments. My rights will be protected, and all my details will be kept confidential, and no details regarding me, personally will be published.
I hereby consent to the surgery.

Patient's name: _____ Signature: _____

Name of the Witness: _____ Signature: _____

Date: _____

Signature of the Researcher._____

Dr E Parker

Appendix- 2

Efficacy of two different types of throat packs

1 File no | | | | | | | | |

2 Name .....

Phone

Home | | Work | |

Cell | |

3 Gender | Male | Female |

4 Age | | | Years

5 Smoke Scale

Non Smoker (1)	Stopped >1yr (2)	Smoking intermit (3)	Present Smoking (4)

6 Experimental Group

Ribbon Gauze	Tampon

7 ASA scale

One	Two	Three	Four

8 # of 8`s Removed (1-4) |

9 Blood dyscrasia | Yes | No |

10 Throat problems | Yes | No |

11 Third molar pathology | Yes | No |

12 Using alt meds | Yes | No |

13 Reduced immun | Yes | No |

14 Post intb epistaxis | Yes | No |

15 Traumatic intb | Yes | No |

16 Blood present | Yes | No |

17 Blood On Distal tip | Yes | No |

18 Sore Throat 2Hours PostOp

no discomfort (0)	Less severe than a cold (1)	Similar to a cold (2)	More severe than a cold (3)

19 Sore Throat 24 Hours PostOp

no discomfort (0)	Less severe than a cold (1)	Similar to a cold (2)	More severe than a cold (3)

CHAPTER NINE - BIBLIOGRAPHY

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