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A PROSPECTIVE RANDOMIZED COMPARISON OF QUINSY TONSILLECTOMY AND INTERVAL TONSILLECTOMY AND A PROSPECTIVE STUDY OF QUINSY TONSILLECTOMY ANAESTHESIA

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PREFACE

In this dissertation I present two studies that were initiated, designed, conducted and analyzed by me.

The first study has culminated in an article entitled "A prospective randomized trial comparing quinsy tonsillectomy and interval tonsillectomy" that has been accepted for publication by the *SAMJ* (in press). The second study entitled "A prospective study of quinsy tonsillectomy anaesthesia" has been submitted to *Anaesthesia*. The studies are complementary.

I would like to express my gratitude to my fellow registrars who assisted with the surgery, to the anaesthetic department for their cooperation with the study, to Mrs Samuels for her clerical assistance and to Dr Duff, Professor Sellars and Professor James for their support.

J.J. Fagan

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CHAPTER 1

INTRODUCTION

A quinsy or a peritonsillar abscess is a suppurative process which occurs in the loose peritonsillar tissues between the tonsillar capsule and the lateral pharyngeal wall.

"Quinsy" is a medieval English term for a throat infection and was used particularly for tonsillitis. The word is derived from the Latin "quinancia" and the Greek "cynanche" which at the time of Hippocrates was reserved for internal inflammations, especially those accompanied by difficulty in breathing and swallowing. It was only at the turn of the 19th century that quinsy became synonymous with peritonsillar abscess [1].

The abscess results from untreated or inadequately treated acute tonsillitis. Dental caries, allergy, malnutrition, immune deficiency, diabetes, leukaemia and other systemic disorders have also been implicated in the pathogenesis [2].

The majority of the abscesses are situated at the superior and midtonsil levels [2,3,4,5]. Abscesses at these sites can be readily drained under local anaesthesia, although these abscesses may be multilocular [1]. The abscesses situated at the level of the inferior pole of the tonsil are however not readily drainable and may be overlooked [3,5]. Unless drained, they are likely to result in a more protracted recovery [1].

The most frequently cultured organisms are Haemophilus

Influenzae, Beta-Hemolytic Streptococcus Group A, Pneumococcus and Staphylococcus Aureus [2,3,5,6]. Using meticulous anaerobic culture technique, Brook found anaerobes in all and pure anaerobic cultures in 19% of quinsies [5]. Two-thirds of quinsies have beta-lactamase producing organisms such as anaerobes and staphylococci which may shield penicillin-sensitive streptococci from eradication by normally bactericidal doses of penicillin [2,5].

Notwithstanding the beta-lactamase production noted above, penicillin and metronidazole are commonly used for quinsies [2].

Quinsies may lead to both local and systemic complications. According to the Registrar-General's returns 226 deaths were attributed to quinsies in England in 1875 [1]. The abscess may rupture with aspiration of pus. This may occur either spontaneously or during intubation for quinsy tonsillectomy. Respiratory obstruction may result from the abscess and from the associated oropharyngeal oedema. A parapharyngeal abscess can evolve with its own complications such as extension to the skull base with cranial nerve palsies and intracranial sepsis, extension of sepsis to involve the retropharyngeal space or along the carotid sheath to the mediastinum, atlanto-axial dislocation due to softening of the anterior transverse ligament of the atlas, and carotid

artery thrombosis, aneurysm or blowout [7]. Jugular vein thrombosis may result and lead to intracranial sepsis and cranial nerve palsies [2]. Systemic complications include dehydration due to pyrexia, dysphagia and trismus, glomerulonephritis, rheumatic fever and metastatic abscesses.

There are two facets to the management of a quinsy. The first is that of the treatment of the acute suppurative process and the second the performance of a tonsillectomy in selected cases.

The acute management comprises general supportive measures such as rehydration, analgesia, antipyretics, airway maintenance, penicillin with or without metronidazole and drainage of the abscess.

Drainage of the abscess not only hastens the resolution of the suppurative process, but it affords immediate pain relief and may prevent the development of the complications listed above.

Drainage may be achieved under local anaesthesia by incision and drainage or by needle aspiration and/or by quinsy tonsillectomy under general anaesthesia.

Incision and drainage for quinsy was first described by Guy

de Chauliac, a 14th century French surgeon [1]. As the incision is made at the level of the superior pole of the tonsil, those abscesses situated at the level of the inferior pole of the tonsil will be missed.

From a prospective study of incision and drainage versus aspiration Spires et al concluded that needle aspiration was as effective as incision and drainage, but was also easier, less painful and averted the risk of aspiration [5].

The third method of abscess drainage is by quinsy tonsillectomy. Also known as tonsillectomy à chaud it was first described in 1859 by Chassaignac [8]. It is defined as the removal of the affected tonsil or more usually both tonsils at the time of acute infection [9].

Compared to incision and drainage or needle aspiration quinsy tonsillectomy ensures complete drainage of the abscess as the tonsil which constitutes the medial wall of the abscess is removed. Quinsy tonsillectomy has the disadvantages of the need for general anaesthesia with the associated risks of abscess rupture and aspiration during anaesthetic induction and potentially difficult intubation, the risks associated with tonsillectomy and the additional expense of surgery and hospitalization.

Quinsy patients that are considered likely to have future

recurrent tonsillitis are advised to have a tonsillectomy. This may be performed either as an interval tonsillectomy or as a quinsy tonsillectomy. An interval tonsillectomy is a tonsillectomy following a quinsy performed once the acute infection has resolved. It is generally done about six weeks after resolution of the quinsy.

There are a number of favourable reports about quinsy tonsillectomy [1,3,4,10,11,12]. Two retrospective studies and one prospective study that compare interval tonsillectomy and quinsy tonsillectomy have been published [8,13,14].

The conclusions drawn in these comparative studies are however not convincing as the patients were not randomized and the selection and exclusion criteria are not mentioned.

Anaesthetists have a cautious approach to quinsy anaesthesia in view of potentially difficult intubations and the risk of abscess rupture [1,15].

Until commencement of the study quinsies at Groote Schuur Hospital were managed by incision and drainage and interval tonsillectomy was recommended for the patients with a history of recurrent tonsillitis.

In view of the lack of properly designed trials that compare quinsy and interval tonsillectomy as well as the paucity of

information about quinsy tonsillectomy anaesthesia I conducted a prospective randomized comparison of quinsy tonsillectomy and interval tonsillectomy and a prospective study of quinsy tonsillectomy anaesthesia.

The study design was submitted to and approved by the Ethics and Research Committee (Protocol No: 45/90) in May 1990 and was completed in 1993.

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CHAPTER 2

A PROSPECTIVE RANDOMIZED COMPARISON OF QUINSY TONSILLECTOMY AND INTERVAL TONSILLECTOMY

2.1 INTRODUCTION

Guy de Chauliac described incision and drainage of peritonsillar abscesses in the 14th Century and in 1859 Chassaignac first reported "tonsillectomy à chaud" (quinsy tonsillectomy) [1]. To this day controversy persists about the best management of peritonsillar abscesses (PTA). Opinions include antibiotics only [2], aspiration and incision and drainage [3,4,5,6,7], unilateral [8,9] or bilateral quinsy tonsillectomy (QT) and interval tonsillectomy (IT).

Two retrospective non-randomized studies have compared QT and IT. In a study of 68 cases McCurdy concluded that QT was safe, reliable and an expeditious form of treatment for PTA, that it was technically easier than IT, that it was a one stage procedure and reduced hospitalization by almost 50 per cent [1]. From a study of 45 cases Lockhart et al concluded that QT reduced hospitalization and work hours lost [10]. From a prospective non-randomized study of QT and IT, Chowdhury concluded that QT reduced hospital stay [11].

This study comprises a prospective, randomized trial comparing interval tonsillectomy and quinsy tonsillectomy.

2.2 AIMS

The study compared the management of PTA by QT and IT in terms of:

i. The period of hospitalization
ii. Loss of employment
iii. Intra-operative blood loss
iv. Intra-operative and postoperative surgical and anaesthetic complications
v. The technical difficulty of the surgery

2.3 MATERIAL AND METHOD

All patients aged sixteen to forty years with PTAs as proven by needle aspiration that presented to Groote Schuur Hospital between August 1990 and September 1991 with a history of previous tonsillitis or peritonsillar abscess and who consented to tonsillectomy were included in the study.

They were randomized into the two groups of quinsy tonsillectomy and interval tonsillectomy using computer generated simple randomization.

Those randomized to QT had the abscess aspirated to dryness

and were commenced on intravenous penicillin. Bilateral tonsillectomy was done within twenty-four hours of admission except the weekend admissions that had the tonsillectomy done on the Monday theatre list. Once apyrexial and eating they were discharged on a course of oral penicillin.

Patients randomized to IT had the abscess aspirated to dryness and were commenced on a course of penicillin. A booking for interval tonsillectomy six to eight weeks later was made. Patients unable to swallow or too ill for ambulant treatment were admitted for supportive therapy and intravenous penicillin.

At the time of QT or IT the intra-operative blood loss was accurately recorded by weighing the swabs and measuring the suction bottle contents. The surgeon noted the side that bled the most, the ease of haemostasis and the surgical difficulty as compared to a routine tonsillectomy. Any intra- and postoperative complications that occurred were recorded.

51 patients were included in the study. 29 were randomized to QT. Of the 22 randomized to IT only 14 returned for surgery.

2.4 RESULTS

The results are listed in tables I, II and III. Five ITs required two admissions, the first an acute admission for the quinsy and the second for the tonsillectomy. There were no intra-operative anaesthetic or surgical complications and no postoperative haemorrhages.

Table 1. The economic implications

	QT	IT	p-value
Days in hospital	2,6 ± 0,9	3,0 ± 1,5	> 0,05
Work days lost	10,3 ± 0,8	17,9 ± 2,4	< 0,001

Table 2. Bleeding and haemostasis

	QT	IT	p-value
Mean blood loss (ml)	158,6 ± 67,7	205,7 ± 139,6	
Difficult haemostasis	31%	64%	< 0,05
Bleeding mainly PTA side	58%	57%	> 0,05

Table 3. The technical difficulty of the surgery

	Easy	Normal	Difficult
QT Abscess side	32%	32%	36%
IT Abscess side	0%	14%	86%
QT Other side	0%	68%	32%
IT Other side	7%	57%	36%

2.5 DISCUSSION

Quinsy tonsillectomy is the standard method of treatment of PTA in many centres [3,8,9,12,13], but criticism can be levelled at this policy insofar as that some patients may never have subsequent tonsillar disease. Age has been suggested as a predictor of subsequent PTA or tonsillitis. Herbild and Bonding reported that of the PTA patients managed by drainage, 48 per cent of those under 40 years and 17 per cent of those over 40 years had subsequent PTAs or tonsillitis [3]. However in children a prior history of tonsillitis has not been shown to have predictive value for post-PTA tonsillar disease [14].

Reported advantages of QT include a reduction in the period of hospitalization, a single procedure, technical simplicity of the surgery on the affected side, complete drainage of the pus, prompt resolution of pain, trismus and pyrexia and prevention of recurrent tonsillar disease [3,9,12,13].

In my study QT had an economic advantage over IT as is evident from the significant reduction in work days lost. There was however no difference in the duration of hospitalization (Table 1).

Intra-operative blood loss has been variably reported both as more and as less with QT than with IT [1,10,15]. In my

study QT was associated with a smaller operative blood loss and easier haemostasis. In both groups bleeding occurred predominantly on the side of the abscess (Table 2).

There were no anaesthetic complications despite the theoretical risks of abscess rupture and difficult intubation with QT. Aspirating the PTA to dryness and administering intravenous antibiotics overnight reduced trismus and tonsillar swelling preoperatively and negated the risk of rupturing a large abscess.

Postoperative haemorrhage did not occur in either the QT or the IT group. In a retrospective study of 1150 patients Kristensen and Tveteras reported that postoperative haemorrhage occurred in 3 per cent of routine tonsillectomies and 19 per cent of ITs, but that there were no cases of haemorrhage with QT [16]. Bonding found no significant difference in post-operative haemorrhage between QT and routine tonsillectomy [12].

QT was technically easier to perform than IT (Table 3). The surgery is easier because the abscess assists the surgeon as it is located in the surgical dissection plane. The dissection in IT is hampered by the fibrosis which occurs in the peritonsillar space following a quinsy.

A striking observation was the immediate postoperative pain

relief that the QT patients experienced as compared to the IT group who, following PTA drainage had a gradual resolution of the pain over a period of a few days.

The poor return of patients for IT (64 per cent) led to a wastage of booked theatre time and is a further reason to favour QT.

2.6 **CONCLUSIONS**

The conclusions drawn from this study are that QT is a safe surgical procedure and that it has distinct advantages compared to drainage followed by IT in terms of:

1. Loss of employment
2. Intra-operative blood loss
3. Technical ease of the surgery
4. Haemostasis
5. Pain relief
6. Single hospitalization

Consequently QT is the preferred management of quinsies in patients considered likely to have future tonsillar infections.

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CHAPTER 3

A PROSPECTIVE STUDY OF QUINSY TONSILLECTOMY ANAESTHESIA

3.1 INTRODUCTION

Quinsy tonsillectomy is a safe surgical procedure [1,2,3] and compared to interval tonsillectomy has the advantages of shorter hospitalization, less working days lost, easier surgery and lower intra-operative blood loss [1,2]. The incidence of postoperative haemorrhage is less than for interval tonsillectomy [4].

Quinsy tonsillectomy anaesthesia has a number of potential problems e.g. the risks associated with anaesthetizing a pyrexial dehydrated patient; abscess rupture with aspiration of pus; and difficult intubation due to trismus, tonsillar swelling and pharyngeal oedema [2,3,5]. Consequently anaesthetists have adopted a cautious approach to quinsy tonsillectomy [5,6].

3.2 STUDY AIMS

This study was instituted by me to assess the anaesthetic risks associated with quinsy tonsillectomy anaesthesia.

3.3 MATERIALS AND METHOD

Between 1990 and 1993 I conducted a prospective study of 50 adult quinsy tonsillectomy patients at Groote Schuur Hospital. The indication for tonsillectomy was a quinsy together with a history of recurrent tonsillitis.

The abscess was aspirated or incised and drained under local anaesthesia. The patients were admitted to hospital for intravenous penicillin, analgesia and rehydration. Quinsy tonsillectomy was done the following day or if admitted over a weekend on the Monday theatre list.

Anaesthesia was administered by all grades of anaesthetic trainees and by consultants (Table 1).

TABLE 1: Grade of anaesthetists

Anaesthetist grade	Patient number
Senior House Officer	4
Registrar 1st year	10
Registrar 2nd year	2
Registrar 3rd year	4
Registrar 4th year	10
Consultant	20

The anaesthetist used Samsoon and Young's modification of

the Mallampati classification (Figure 1) in 48 patients to evaluate the airway preoperatively and to predict difficult intubation [7]. The Mallampati assessment relates the height of the tongue base to the palatopharyngeal arch. In studies of patients with anatomically normal soft palates and tonsillar pillars the assessment relates well to the size of the tongue base and the laryngoscopic visualization of the larynx [7,8,9].

The presence of trismus was recorded pre- and postinduction.

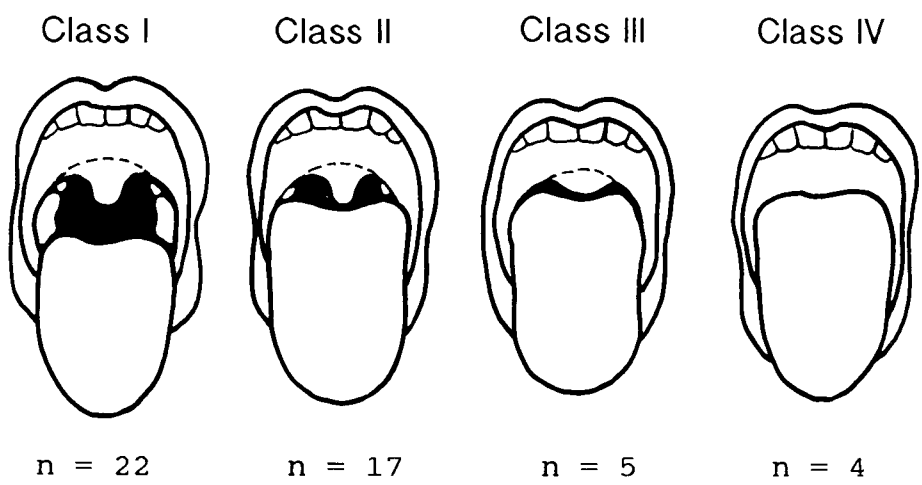
Intravenous induction was performed unless the anaesthetist considered that difficult intubation was likely, in which case gas induction was performed. Once it had been established that ventilation by face mask was possible, muscular relaxation was induced prior to tracheal intubation where intravenous induction had been employed. Tracheal intubation was performed using cuffed orotracheal tubes and the anaesthetist graded the laryngoscopic glottic exposure according to the Cormack and Lehane classification (Fig 2)[8].

3.4 RESULTS

The patients studied comprised 17 males and 33 females aged between 16 and 47 years. The quinsies were right sided in 28, left sided in 20 and bilateral in 2 patients. The patients were all medically fit and there were no exclusions from the study for anaesthetic or medical reasons. All the patients had unrestricted neck mobility preoperatively.

The Mallampati assessments are listed in Figure 1. Nine patients were Classed III and IV.

FIGURE 1: Mallampati scores (Samsoon/Young modification)



Thiopentone was used for induction of anaesthesia in forty-seven patients. Propofol was used in one case and two patients were induced by gas induction using halothane. Forty-eight of the 50 patients were paralysed prior to intubation, 40 with suxamethonium, six with vecuronium, one

with alcuronium and one with atracurium.

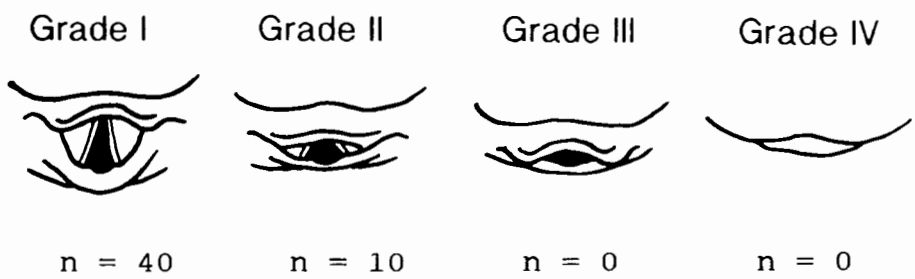
Preinduction trismus was present in 31 patients. A variable degree of postinduction trismus persisted in 7 patients, 2 of whom had not been paralysed for intubation.

Mask ventilation prior to intubation was noted to be easy in all 50 cases.

Oropharyngeal oedema interfering with the laryngoscopic view of the glottis was present in 4 cases.

Glottic exposure by direct laryngoscopy in accordance with the Cormack and Lehane classification was grade I in 40 patients and grade II in 10 patients. There were no grade III or IV cases (Figure 2). Of the 10 grade II patients, 5 had variable degrees of postinduction trismus.

FIGURE 2: Cormack and Lehane scores



There were no intra-operative anaesthetic complications. The intra-operative blood loss as calculated by the suction bottle contents and weight of the tonsil swabs varied between 25ml and 366ml with a mean volume of 176ml.

Two patients had minor post-extubation problems. One had mild laryngospasm and the other developed hypoxia (pulse oximeter reading of 84%) during the anaesthetic recovery period which responded to adrenaline nebulizations and oxygen. Neither required reintubation. There were no other postoperative complications.

3.5 DISCUSSION

The preoperative management of the quinsy patient is an important contributing factor to safe anaesthesia. The abscess must be drained preoperatively. Not only does this afford pain relief, but it reduces the size of the tonsillar swelling, reduces the degree of trismus and prevents abscess rupture at the time of intubation. The patients in this study all received at least 12hrs of preoperative antibiotic therapy which, coupled with drainage of the abscess and rehydration of the patient improved the patient's general condition prior to anaesthesia.

Trismus is a well recognized cause of difficult intubation

[7,8]. It is interesting to note that trismus resolved completely during induction in 77,4% of the patients. Trismus in quinsy patients is due to muscle spasm and pain associated with the peritonsillar space sepsis. Unlike trismus in conditions such as temporomandibular joint pathology and tumour infiltration of the pterygoid muscles, the muscle spasm in a quinsy patient is relieved by the induction agents and muscle relaxants. Trismus due to a quinsy should therefore not be viewed with the same gravity as trismus due to the other causes mentioned which is likely to persist despite anaesthesia and muscle paralysis.

A correlation between the Mallampati preoperative airway assessment, the Cormack and Lehane grading of glottic exposure and the difficulty of intubation has been described [7,9]. This correlation did not apply in the quinsy patients studied. Despite 9 patients with Class III and IV Mallampati scores, persistent trismus in 7 cases and oropharyngeal oedema and tonsillar enlargement the view of the larynx was surprisingly good as evidenced by the Grade I and II Cormack and Lehane glottic exposure scores.

The Mallampati assessment relates the height of the tongue base to the palatopharyngeal arch (Figure 1) and was evolved in studies of patients with normal palatopharyngeal arch anatomy [9]. In patients with anatomically normal soft palates and tonsillar pillars the assessment relates well to the

size of the tongue base and the laryngoscopic visualization of the larynx [7,8]. In quinsy patients the palate is swollen and depressed and the tonsils enlarged. This distortion of the palatopharyngeal arch together with the accompanying trismus makes use of the Mallampati scoring system an inappropriate method to predict difficult intubation in quinsy patients.

The good Cormack and Lehane grades despite poor Mallampati scores illustrates an important difference between oropharyngeal soft tissue swelling due to a quinsy and swelling due to other conditions such as Ludwig's angina and floor of mouth and tongue base tumours. In a quinsy the swelling and induration involve the palatopharyngeal arch and do not interfere with manipulations of the tongue with the laryngoscope blade. However in Ludwig's angina and in floor of mouth and tongue base tumours manipulation of the tongue is impaired and glottic exposure is restricted.

As I reported in Chapter 2, quinsy tonsillectomy results in a smaller intra-operative blood loss than interval tonsillectomy and the volumes lost are not of anaesthetic consequence in a well hydrated, nonanaemic patient [1].

Only minor extubation and anaesthetic recovery problems occurred in the 50 patients studied.

3.6 CONCLUSIONS

I conclude from this study that:

1. The Mallampati grading system is not applicable to quinsy patients and to patients with distortion of the palatopharyngeal arch.

2. Preinduction trismus resolves during induction in the majority of quinsies. When a variable degree of post-induction trismus was present it did not complicate orotracheal intubation.

3. Anaesthetic risk must be optimized by preoperative drainage of the abscess, rehydration and antibiotics.

4. Quinsy tonsillectomy is not associated with significant intra-operative or postoperative anaesthetic or bleeding complications.

5. With the failure of the Mallampati system to predict difficult intubation, every quinsy anaesthetic should be approached as a potentially hazardous intubation.

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CHAPTER 4

THE FINAL CONCLUSIONS

I have presented two studies designed to compare the use of quinsy tonsillectomy and interval tonsillectomy in patients presenting with quinsies and a past history of tonsillar infections, and to establish the safety of anaesthesia for quinsy tonsillectomy.

The results of previously published comparisons of quinsy and interval tonsillectomy are unconvincing as the patients were not randomized and the selection and exclusion criteria not mentioned [1,2,3]. These requirements were adhered to in my study.

Only one report on anaesthesia for quinsy tonsillectomy has been published and anaesthesia for quinsy tonsillectomy is still approached with caution [4,5]. The validity of the Mallampati scoring system has not previously been evaluated in patients with abnormalities of the palatopharyngeal arch.

In the first study (Chapter 2) I demonstrated that quinsy tonsillectomy is a safe procedure and that it has a number of advantages as compared to interval tonsillectomy. These advantages are a reduction in the period of loss of employment, reduced intra-operative blood loss, easier surgery and haemostasis, rapid resolution of pain and a single hospitalization.

In the second study (Chapter 3) I showed that the

anaesthesia for quinsy tonsillectomy was devoid of serious complications, that trismus resolved completely in the majority of patients and that intubation was not complicated by the quinsy or by the associated trismus.

I also found that the Mallampati scoring system cannot be used as a predictor of difficult intubation in patients with distortion of the palatopharyngeal arch due to quinsy, and concluded that every anaesthetic for a quinsy tonsillectomy should therefore be approached as a potentially difficult intubation.

Based on the results of these two studies, patients with quinsies who are likely to have future recurrent tonsillar infections are now managed by quinsy tonsillectomy at Groote Schuur Hospital.

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