A Comparison of the Incidence of Post Operative Bleeding Between Electric Cauterization and Suture Ligation Tonsillectomies

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Abstract

Two-thousand one-hundred tonsillectomies performed from January 1980 to December 1995 by otolaryngologists at Pramongkutklao General Hospital were reviewed. The Dissection-Tyding snare technique was used and hemostasis completed by electric cautery in 690 cases. by suture ligature in 720 cases, by guaze packing alone as a control in 600 cases respectively.

It can be concluded that the use of suture ligature offers an efficient and practical method to reduce the incidence of primary tonsillectomies bleeding.

The incidence of post operative bleeding varies from 1 per cent to 20 per cent(1). Approximately half of the bleeding occurs immediately after the operation and the remainder occurs during the following one or two weeks. There was an overall incidence of 5 per cent post operative bleeding in 15 reports involving 30,000 operations. Bellucci(2) did a statistical study of 1,216 cases of postoperative tonsillectomies and adenoidectomies bleeding in 19,754 cases of adenotonsillectomies and concluded that the incidence of primary bleeding is 4.7 per cent and that of secondary bleeding 1.4 per cent. Fox(1) noted an overall 5 per cent incidence of secondary bleeding in 1,746 cases and Neivert(3) reported a 10 per cent incidence of late tonsillar haemorrhage. Cumming(4), reviewing 20,000 adenotonsillectomies, revealed 9 deaths from inadequate control of haemorrhaging both during the operation and during the postoperative period.

MATERIAL AND METHOD

A total of 2,100 tonsillectomies performed consecutively at Pramongkutklao General Hospital from January 1980 to December 1995 were reviewed.

The patients' ages ranged from 13 to 59, with males being slightly predominant. Tonsillectomies on children were routinely performed under endotracheal anaesthesia, while most of these performed in adults were done in the sitting position and under local anaesthesia. Before going to the

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operating theatre, each patient had been checked by means of routine laboratory tests, X-ray film of the chest postero-anterior and coagulograms which included prothrombin times, partial thromboplastin times, bleeding times and clotting times.

All of the procedures were done by the dissection and Tyding snare technique. Hemostasis was completed by either Bovie electric cautery, suture ligature or pressure gauze packing alone.

RESULTS

Six hundred and ninety patients who had undergone tonsillectomies had bleeding points stopped by electrocauterization. Postoperative bleeding occurred within 24 to 48 hours and afterwards in 10 and 20 patients respectively. This finding represents a 1.44 per cent incidence of bleeding within 24 to 48 hours and a 2.90 per cent incidence of bleeding after 48 hours. Hence, the total incidence of bleeding was 4.34 per cent. The total incidence for suture ligature and gauze packing was 2.08 and 10 per cent respectively. (Table 1.)

The average time for each category of hemostasis is shown in Table 2. The shortest time (in minutes per case) was 15-25 minutes for electrocauterization. Gauze packing proved to be the longest hemostatic method, taking 40-60 minutes to complete hemostasis. Suture ligature took 20-30 minutes to complete hemostasis. Demographic analysis shows no correlation between the male and female in association with the method of hemostasis employed. (Table 3) Table 4 demonstrates that the bleeding complications occurred in all age groups, bleeding though, patients in the younger

Table 1. Postoperative bleeding in each procedure.

Procedure	Number of cases of bleeding		Incidence of bleeding		Total
	Within 24 hours (1°)	After 48 hours (2°)	Within 24 hours	After 48 hours	
Electric cautery (N=690)	10	20	1.44 %	2.90 %	4.34 %
Suture ligature (N=720)	10	5	1.39 %	0.69 %	2.08 %
Gauze packing (N=600)	30	30	5 %	5 %	10 %

Table 2. Hemostatic time in each category.

Hemostatic method	Average operative time (in minutes per case)
Electrocauterization (N=690)	15-25
Suture ligature (N=720)	20-30
Guaze packing (N=600)	30-60

Table 3. Bleeding after surgery in correlation with sex

Bleeding after surgery	Sex	
	Male	Female
Within 24-48 hours	25 (45.5 %)	25 (50 %)
After 48 hours	30 (54.5 %)	25 (50 %)
Total	55 (100 %)	50 (100 %)

Table 4. Bleeding after surgery in correlation with age.

Bleeding after surgery	Age in years			Total
	10-30	31-50	51-60	
Within 24-48 hours	30(60 %)	15 (30 %)	5 (10 %)	50
After 48 hours	35(63.6%)	15 (27.3%)	5 (9.1%)	55

age group (10-30 years old) was more often (60%) complicated by hemorrhagic episodes than in the older group (10% or 5 patients in 51-60 years old group). This was the same for both during the period of 24-48 hours and after 48 hours.

DISCUSSION

While anaesthetic complications in adenotonsillectomies included severe nausea, vomiting and dehydration, the main surgical complication consisted of bleeding episodes. This problem can be prevented by knowing the most effec- tive means of achieving hemostasis. As regards the blood supply to the tonsil, Hollinshead states that the arterial supply enters primarily at the lower pole through the tonsillar branch of the facial artery(5). There are typically three arteries at the lower pole: the tonsillar branch of the dorsal lingual artery anteriorly, that of the ascending palatine artery (a branch of the facial artery) posteriorly, and the tonsillar branch of the facial artery between them (entering the tonsillar bed from the lower pole). The tonsillar branch of the facial artery is the largest artery that pierces through the capsule of the tonsil. Towards the upper pole of the tonsil a twig from the ascending pharyngeal artery enters the posterior aspect of the tonsil, and the lesser palatine artery descends to the upper pole.

According to Fig. 1 below, there are typically three arteries to the lower pole of the tonsil and two arteries to the upper pole. It would seem logical to provide good haemostasis at both poles of the raw fossa surface. Anyway, we believe that suturing the anterior pillar together with the posterior pillar (using chromic catgut number 2/0), and then the suture ligatures carefully placed or the vessels carefully tied, is the method of choice for preventing the complications due to postoperative haemorrhaging.

Comparing hemostasis achieved by using suture materials and electrocauterization, the anatomy of the tonsillar fossa may change by closing with sutures, but it needs 14 days to dissolve the suture material. While the whitish coagulum resulting from cauterization may be sloughed off in a few days, the wound may become infected and bleeding occur.

Philipps(6) and Fujiromi(7), stated that the bacteria at the raw surface in the tonsillar fossa were the same as the normal flora. Tissue biopsies showed that there was no significant difference in the amount of inflammatory reaction or fibroblastic proliferation and that the scar in the tonsillar fossa was no bigger and there was no morbidity afterwards. There was no correlation among these methods between bacterial infection, scaring and

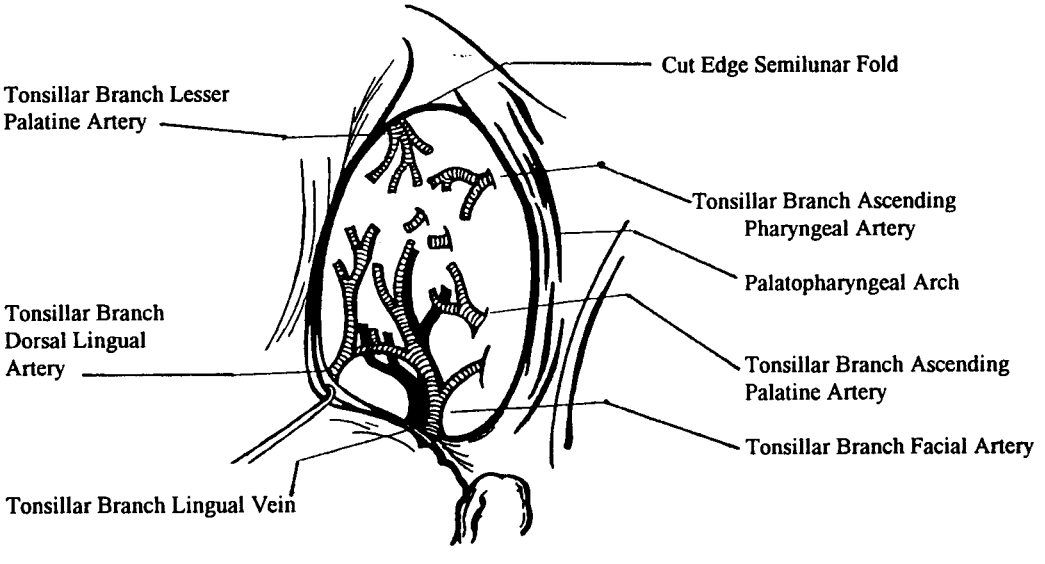

Fig. 1. Arterial supply of the tonsil.

morbidity. Electrocauterization shortened operative times when compared to the other methods. Carmody[8], in a review of 3,756 cases of tonsillectomy, reports that the incidence of primary and secondary haemorrhaging was the same (10%). Both types of haemorrhaging were more common in patients in the adult age range, i.e., 10-19 years old. More females experienced secondary bleeding than males. No patient with secondary haemorrhaging experienced any obvious infection of the respiratory tract. The use of diathermy during the operation was associated with a higher rate of secondary bleeding.

In our series, the incidence of primary bleeding was 1.42 per cent and that of secondary bleeding 2.85 per cent (by using diathermy), and was more common in patients in the same age range (10-30 years). There was no significant difference in terms of complications arising from bleeding between the males and females. Applying a sponge pressure to the raw surface of the tonsillar fossa, is frequently adequate,but it certainly does not result in permanent hemostasis.

SUMMARY

There may be numerous approaches to solve the problem of tonsillar postoperative hemorrhage, which are almost equally effective. In our hand, however, the suture ligature is the so effective that we strongly recommend the use of suture ligature in tonsillectomy to prevent this serious, life threatening complication.

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การเปรียบเทียบภาวะแทรกซ้อนเลือดออกหลังการผ่าตัดทอนซิล

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ระหว่างเดือนมกราคม 2523 ถึง เดือนธันวาคม 2538 มีผู้ป่วยจำนวน 2,100 ราย ได้รับการวินิจฉัยเป็นโรคของทอนซิล และได้รับการผ่าตัด ในโรงพยาบาลพระมงกุฎเกล้า ฯ โดย โสต ศอ นาสิก แพทย์ ด้วยวิธีคล้องและตัด ใช้ขดลวด พื้นที่ใต้ทอนซิลที่มีเลือดออก ได้รับการรักษาทั้งหมด 3 วิธี คือใช้ไหมเย็บผูกเส้นเลือด จำนวน 720 ราย ใช้ผ้าก๊อซกดให้เลือดหยุด 600 ราย และใช้ไฟฟ้าจี้ให้หยุด 690 ราย การวิเคราะห์พบว่า การใช้ไหมเย็บผูกเส้นเลือดให้เลือดหยุดแล้วเย็บปิดแผลโดยดึงด้านหน้าและด้านหลังของทอนซิลเข้ามาหากัน เป็นวิธีที่ดีที่สุดที่จะป้องกันการเกิดภาวะแทรกซ้อนเลือดออกจากแผลหลังการผ่าตัดทอนซิล ภาวะแทรกซ้อนนี้เกิดได้ทั้งในเพศชายและหญิงโดยไม่มีความแตกต่างทางสถิติ

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