International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 11, No. 3,July-September 2022 Online ISSN: 2250-3137
Print ISSN: 2977-0122

Original Research

Prospective Study of Comparison of Post-Operative Complications of Tonsillectomy by Molecular Resonance Generator Versus Conventional Tonsillectomy

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Received Date: 02 August 2022 Accepted Date: 13 September 2022

Abstract

Introduction: The hemostasis of the QMR device is completed by triggering the denaturation of the protein fibrinogen to coagulate after breaking cell molecular bindings. Thus, the present study was undertaken to compare morbidity and complications associated with tonsillectomy by molecular resonance generator and conventional tonsillectomy in the randomly selected two group of patients.

Materials and Methods: The present study was among 80 Patients attending ENT OPD who were identified as candidates for tonsillectomy and were randomly selected for tonsillectomy procedure by Molecular resonance generator and Conventional method. Postoperative pain was assessed on first, second and seventh postoperative day. The pain was assessed using visual analogue scale (VAS). The episodes of postoperative bleeding from the tonsillar fossa were documented including the day on which it occurrs and the interventions required to stop it.

Results: 60-75 percent of patients said that the tonsillectomy by MGR was more painful overall, than the other which conventional was used. Other thirty percent said that conventional method was more painful and this was statistically significant. Pain was measured by VAS scale. Under this scale the mean pain averaged over 7days was 5.487 with MRG and 5.076 for conventional method. There was no case of reactionary or secondary hemorrhage in both MRG and conventional method.

Conclusion: To conclude, tonsillectomy by molecular resonance generator method is easy to perform and it is safer with significant advantages in terms of postoperative morbidity. But the only deterring factor in the regular usage of molecular resonance generator method is the cost factor which has to be overcome.

Keywords: Hemostasis; Tonsillectomy; Quantum molecular resonance coagulation

INTRODUCTION

Tonsillectomy is a very common surgical procedure.[1] Tonsillectomy despite being the commonest and simplest surgery the surgeon is always keen about its high risk of complications i.e., intra and post operative haemorrhage which may even lead to shock and death. Since oropharynx and tonsils are rich in blood supply the risk of hemorrhage is very high in tonsillectomy.[2] The major postoperative morbidity problems are pain and hemorrhage.[3] The pain is the result of disruption of mucosa and glossopharyngeal nerve fiber irritation followed by inflammation and spasm of the pharyngeal muscles that leads to ischemia and protracted cycle of pain, it does not completely subside until the muscle becomes covered with mucosa 14–21 days after surgery.[4] The postoperative secondary hemorrhage is due to secondary infection of the tonsillar fossa resulting in disruption of vessels and bleeding.[5] Quantum molecular resonance coagulation is an innovative technology that uses molecular resonance to cut and coagulate precisely,

cleanly, and hemostatically at low tissue temperature levels. This technology offers a new possibility for tonsillectomy.[6] The hemostasis of the QMR device is completed by triggering the denaturation of the protein fibrinogen to coagulate after breaking cell molecular bindings. The process also activates the physiological coagulation cascade without the need for necrotic plugs, which is contrary to methods that use other cauterization methods.[7] Thus, present study was undertaken to compare morbidity and complications associated with tonsillectomy by molecular resonance generator and conventional tonsillectomy in the randomly selected two group of patients.

MATERIALS AND METHODS

The present study was conducted in the Department of Otorhinolaryngology, Sardar Patel Medical College & A. G. of Hospital, Bikaner among 80 Patients attending ENT OPD who were identified as candidates for tonsillectomy and were randomly selected for procedure tonsillectomy by Molecular resonance generator and Conventional method.

Inclusion criteria consisted of patients who attended ENT OPD with indication of tonsillectomy above the age of 3 years and had given the consent and were fit for surgery. Exclusion criteria comprised of asymmetrical and unilateral enlarged tonsil, children with chronic tonsillitis who were below the age of 3 years and patients who needed adenoidectomy, myringotomy and grommet insertion. All patients included in the study were subjected to detailed history taking and examination pertaining to ear, nose and throat.

All patients included in study were examined and investigated by clinical examination, pure tone audiometry (in selective cases for exclusion criteria), impedance audiometry (in selective cases for exclusion criteria), x-ray skull soft tissue lateral view (in selective cases for exclusion criteria), diagnostic nasal endoscopy (in selective cases for exclusion criteria), routine blood investigations (complete blood count, renal function tests etc.), chest x-ray and ECG. All patients who were planned for tonsillectomy were assessed for general anaesthesia.

After complete work up, patients were randomly selected, through this study, half of the patients tonsillectomy was done by using molecular resonance generator and in the other half of the patients tonsillectomy was done by conventional method. Under general anaesthesia using nasotracheal intubation, patients put in Rose position. After painting and draping Boyle Davis mouth gag with tongue blade introduced. Tonsil was retracted medially and held by using Dennis Brown tonsil holding forceps. An incision made in the mucosal reflection site and the medial margin of anterior pillar. Plica semilunaris at the upper pole released. Posterior pillar mucosal reflection released with curved scissors. Tonsil dissected from its bed using Mollison dissector upto inferior pole and inferior pole snared. Tonsillar fossa packed, after securing haemostasis, pack removed and similar procedure was done on the other side. The patient undergoing conventional tonsillectomy was regarded as control in comparison to the patient undergoing tonsillectomy by using molecular resonance generator in terms of post operative pain, wound healing and bleeding.

Postoperative pain was assessed on first, second and seventh postoperative day. The pain was assessed using visual analogue scale (VAS)[8] (0-10) which consists of a line, usually 10 cm long. The ends are labeled as the extremes ('no pain' and 'pain as bad as it could be') and the rest of the line is blank.

The patient was asked to put a mark on the line indicating their pain intensity. The distance between that mark and the origin is measured to obtain the patient's score. Patients was enquire about the maximum pain during the first, second and seventh postoperative day. The area of slough in each tonsillar fossa was assessed by direct visual examination. The extent of healing within the tonsillar fossa was estimated by recording the percentage of the fossa that has remucosalized. The episodes of postoperative bleeding from the tonsillar fossa were documented including the day on which it occurs and the interventions required to stop it.

RESULTS

The total number of females were 34 (34%). the total number of males were 46 (46%) (table 1). 60-75% of patients said that the tonsillectomy by MGR was more painful in overall, than the other which conventional was used. Other thirty percent said that conventional method was more painful and this was statistically significant. Pain was measured by VAS scale. Under this scale the mean pain averaged over 7days was 5.487 with MRG and 5.076 for conventional method (table 2-5, figure 1). There was no case of reactionary or secondary hemorrhage in both MRG and conventional method.

Table 1: Gender Distributions of Patients

Sex	Patients
Female	34 (34%)
Male	46 (46%)

Table 2: Comparison of Post Operative Pain in First Post OperativeDay in MRG and conventional method

1st Post operative pain VAS scale	MRG (n =40)	CONVENTIONAL (n =40)
Mean	7.6	6.77
Std. Deviation	0.489	.790

Table 3: Comparison of Post Operative Pain in Second Post-operative Day in MRG and conventional method

2st Post operative pain VAS scale	MRG (n =40)	CONVENTIONAL (n =40)
Mean	5.5	5.125
Std. Deviation	.7416	.713

Table 4: Comparison of Post Operative Pain in Seven Post OperativeDay in MRG and conventional method

7st Post operative pain VAS scale	MRG (n =40)	CONVENTIONAL (n =40)
Mean	3.36	3.33
Std. Deviation	.5846	.7071

Table 5: Comparison of Post Operative Pain in First, Second and Seventh Post Operative Days in MRG and CONVENTIONAL method

Postoperative Day Pain scale	MRG	CONVENTIONAL	P Value
1st pod	7.6	6.77	0.001
2nd pod	5.5	5.125	0.024
7thpod	3.361	3.33	0.831

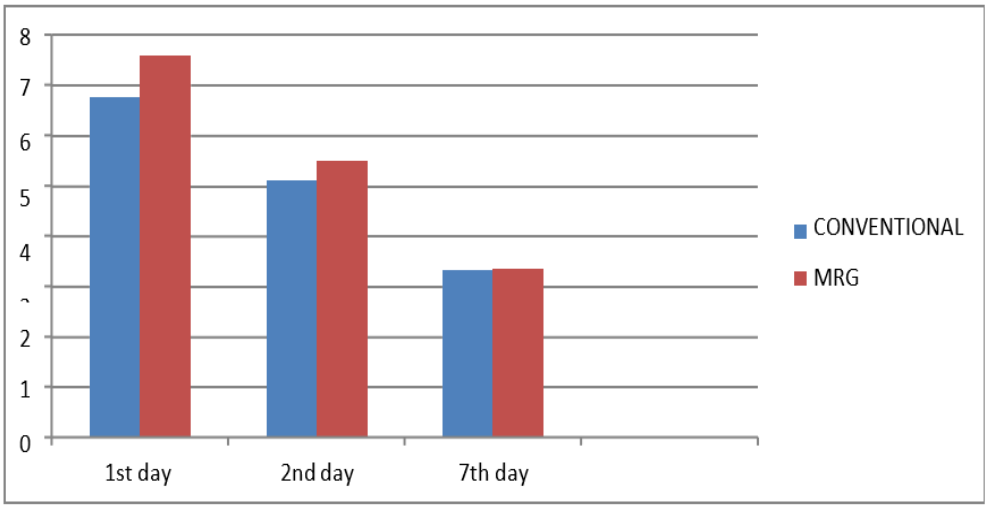

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Figure 1: Comparison of Post Operative Pain n First, Second and Seventh Post Operative Days

DISCUSSION

Tonsillectomy is one of the most common procedures performed by otolaryngologists worldwide. Indications for surgery include chronic infection, upper airway obstruction, and suspected neoplasm. Despite being extremely rare, life-threatening complications might occur due to post-tonsillectomy hemorrhages.[9] Although most tonsillectomies are performed without complications, current studies demonstrate a 2% to 5% risk of post-tonsillectomy bleeding in patients with normal coagulation function.[10,11]

The post operative pain which was measured using VAS scale was compared in both methods on first, second and seventh post operative days for Conventional method the mean post operative pain scores was 6.775, 5.125 and 3.33. Respectively whereas in molecular resonance generator method 7.60, 5.50 and 3.3611 so about 60- 70% patients had higher pain in molecular resonance generator method compared to the conventional method. There was no primary or secondary hemorrhage in our study. These results were analysed and compared using chi-square testing and it was found to be statistically significant.

Almost equal male to female distribution was found in study most studies did not show much influence of gender. Initial studies on molecular resonance generator method showed a significant decrease in post operation pain scores comparing with conventional method. On other hand some studies reported no significant reduction in pain with molecular resonance generator method surgery. Chang H et al[12] described tonsillectomy by molecular resonance generator method was significantly more painful and also found coblation method caused less pain in first 3 post operative days. Timms MS et al[13] suggested significant benefit in post operative pain levels in coblation method. In our study we found pain was significantly more on 1, 2, & 7th POD then in conventional method and the p value was <0.001, <0.001, <0.002 respectively and statistically the pain was significantly more in our study. In our study there was no reactionary or secondary hemorrhage in any patient. In a similar study by D'Agostino R et al,[14] postoperative pain scores resulted significantly different between the two methods on days 5 ($p = 0.05$) and 8 ($p = 0.001$) in evaluations by mothers. Moreover, in evaluations by patients pain scores resulted significantly different between the two methods on days 3 ($p = 0.02$), 8 ($p = 0.005$) and 9 ($p = 0.01$). There was no difference between boys and girls in pain scores in the 10 days considered, nor between children older than 5 years and children younger than or aged 5 years. No statistically significant differences between the two techniques were found in the use of analgesics in all postoperative evaluations.

CONCLUSION

To conclude, tonsillectomy by molecular resonance generator method is easy to perform and it is safer with significant advantages in terms of postoperative morbidity. But the only deterring factor in the regular usage of molecular resonance generator method is the cost factor which has to be overcome.

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