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Research Article

Endoscopic Adenoidectomy with Microdebrider

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Abstract: This present study was conducted to describe endoscopic power assisted adenoidectomy and review the experience regarding safety and effectiveness. 38 patients, who under vent power assisted adenoidectomy aged between 6to 14 were included between intervals of September 2013 to march 2015. Average operated time, average blood loss complications, collateral damage, complete removal, recovery time and surgeons satisfaction were noted. Average operative time was 20 min (15 – 26 min) and average blood loss was 28 ml (range 10 – 45 ml). Better visualization with endoscope helps in complete resection of adenoids tissue with minimal complications and good surgeon satisfaction. The study parameters fared better with completeness of resection, lesser collateral damage and faster recovery time.
Keywords: Adenoidectomy, curettage method, endoscopy.

INTRODUCTION

Adenoidectomy is a commonly performed ENT surgery. It is conventionally performed using the curettage method. Canon *et al*. [1] popularized endoscopic assisted adenoidectomy (EAA) calling it "natural progression of endoscopic technology to allow a more complete adenoidectomy".

During the last 20 years, we have observed on increasing recognition of the high prevalence of sleep disordered breathing in children. Adenotonsillar enlargement, leading to a partial or complete obstruction of nasopharynx /oropharynx account for majority of cases. Consequently adenoidectomy performed in children has increased significantly. An adenoidectomy can be performed as an isolated procedure or as a part of an adenotonsillectomy operation. Adenoidectomy is conventionally performed using the curettage method with an adenoid curette. This procedure is blind procedure and described since 1885.

The classical surgical technique with adenoid curette has now evolved by introduction of endoscope and microdebrider with improved patients outcome and satisfaction of surgeon. The study highlighted various advantages and disadvantages of power assisted adenoidectomy. Complications such as bleeding, inadequate removal and morbidity are best prevented by good visualization by endoscope and prescribed debridment by microdebrider.

MATERIALS AND METHODS

The present study was carried out in a tertiary care hospital. Complete endoscopic power assisted adenoidectomy was performed. A Prospective study of 38 children who underwent endoscopic power assisted adenoidectomy from September 2013to march 2015 was conducted. The children were aged between 6 to 14 years (median age: 10 years), 24 being males (63.15%) and 14 females (36.84%). These patients had symptoms of nasal obstruction, mouth breathing, snoring, conductive hearing loss and recurrent sinusitis. All patients were assessed endoscopically and graded according to Clemens and McMurray Scale.

CLEMENS AND McMURRAY SCALE for adenoid hypertrophy assessment		IN OUR STUDY (No. of patients with percentage)
Grade I	adenoid tissue filling 1:3 of the choana	02 (05.26%)
Grade II	up to 2:3	13 (34.21%)
Grade III	2:3 to nearly all but not complete	18 (47.35%)
Grade IV	complete choanal obstruction	05 (13.10%)

In our study the endoscope was used along with a micro-debrider in the oscillating mode with saline irrigation to curette and shave off the adenoid tissue using adenoidectomy blades. The procedure was visualized using 2.7mm and 4mm nasal endoscopes using the contra lateral nostril as the conduit. When it was not possible to introduce the scope from the opposite side, an angled 45-70 degree scope was introduced through the oral cavity and working end of the instruments seen. The intra-operative parameters studied were operative time, primary bleeding, and completeness of removal of adenoid and collateral damage. Post-operative parameters included assessment of post-operative pain and recovery time.

Intra operative time was defined as the time taken for completion of the procedure from the time patient was handed over by the anaesthetist and included setting up of instruments, operative steps, packing and securing the bleeding. The measurement ended when the patient was handed back to the anaesthetist. Adenoid hypertrophy was confirmed by radiograph of nasopharynx and nasal endoscopy with 0° sinuscope.

In the endoscopic method, the blood loss was assessed by the difference in amount of irrigating fluid used and from aspired blood plus differential weight of the packages. The completeness of adenoid removal was assessed by nasal endoscopy at the end of the procedure in both groups. A less than 20% residual adenoid was regarded as complete removal, 20-50% as partial and more than 50% residual as sub-optimal removal. . The depth of resection was recorded depending on the plane of tissue dissection reached.

Intra operative complications such as injury to surrounding structures were noted. The surgeon performing the procedure noted this level of satisfaction. Post operatively, the patient was assessed for post operative pain using a six point faces scale (where 0= no pain and 5= intolerable pain). The recovery time was defined as the number of days taken to return to normal activity as gauged by the patient / parents during the routine post operative follows up visit at seven days. On follow up after a week the patients were assessed for various pains, neck stiffness, speech changes and swallowing problems. Endoscopic nasopharyngeal examination was done and the adequacy of adenoid removal assessed. Patient's recovery in terms of time required to return to his normal diet and activities was noted.

TECHNIQUE

A general or tracheal anaesthesia is given for the surgery. The patient is placed in a supine position with neck slightly extended and the surgeon placed right to the patient. A Boyle's Davis mouths gag the same for tonsillectomy is positioned. The nasal cavities were decongested by using pledgets soaked in saline adrenaline solution at ratio (5:1). The posterior choanae and nasopharynx were assessed with a 0° & 2.7 mm rigid telescope (4 mm for older children). Two methods were commonly used for surgical approach. Sinuscope and debrider were passed through the same nostril or, the sinuscope through one nostril and debrider through the other (Fig. 2).

Fig 1: Shows microdebrider kit.

Fig 2: Shows microdebrider with irrigating suction.

Two rubber catheters are introduced through the nasal fossa to apply the light traction to the soft palate. This help in increasing the anterior posterior diameter as well as help to detect a soft palate cleft. A 70degree endoscope is introduced through the mouth to visualize the nasopharynx and consequently a 40 degree curved plate microdebrider is introduced through the mouth.

The microdebrider is connected to aspirator and a rotational speed of 1200rpm.Care should be taken to avoid trauma to turbinate or the septum. The suction present in microdebrider draws the adenoid tissue in and the rotating blade shaves it under constant

endoscopic vision. Removal of adenoid tissue starts from choanal extension and proceeds along the vault towards the posterior wall of nasopharynx. The cutting and aspirating action of the shaver and simultaneous irrigation removes both adenoid tissue and the blood, thus providing a clear view. The adenoid tissue need to be completely removed without damaging the mucosa.

Better control of the depth of removal of adenoid is achieved by keeping the perimycial layer intact. At the end of the resection a gauge packing could be placed and maintained for some minutes. The pack is removed and then cavity is checked for remnent and for bleeding. Post operative care was given with normal diet. All patients were followed up after a week and then monthly over 6 months to 1 year. At follow up, endoscopic nasopharyngeal examination was done to assess healing and completeness of removal.

Intra operatively size of adenoid, operative time, blood loss, complete resection, surgeon satisfaction and complications were noted. Adenoid size was recorded based on Clemens and McMurray Scale.

RESULT

Total no. of patient was 38. The mean age of patient was 10 yrs. Out of which 24 (63.15%) were males and 14 (38.84%) were females. Nasal obstructions were found in all patients. Other indication having otits media, snoring, conductive hearing loss and recurrent rhino sinusitis. Most patients have more than one complaint.

Size of the adenoid were assessed with endoscope and most patient have grade II (34.21%) and grade III (47.25%) adenoid hyperplasia. The mean operating time was 20 minutes. Blood loss (aspired blood plus differential weight of the packages removed) was around 28ml. No drawbacks have been found in terms of intraoperative complication or poor post operative course.

Post operative, the patient was assessed for post operative pain and symptomatic improvement amongst the patients in our series 5 (13.15%), complained of post operative neck pain and stiffness which was relieved with analgesics, pain was minimal and sympatomatic improvement was excellent. Hospitalization never exceeded 24hr.

Post operative endoscopy was used to look for residual adenoid tissue which showed invariably complete removed and minimal trauma or collateral damage to surrounding tissue. Patient was regularly followed up and both patient and surgeon satisfaction was excellent.

DISCUSSION

Adenoidectomy is still one of the most frequently performed and most appropriate treatment in certain specific conditions, especially in children. Earlier adenoidectiomy was done with help of adenoid currete . Although the traditional method using a curette also has good results but being performed blindly has its own demerits, the most important being bleeding (0.5–8% incidence) [2].It may damage the torus tubaris, mucosa and Eustachian tube orifices [3].

To prevent these complications and to improve results and with advancement in endoscope and better diagnostic facility, the surgical technique also needed to be evolved. Thus various techniques of adenoidectomy have been devised.]. Adenoidectomy with curette using a transnasal endoscopic approach has been described [4, 5]. Others have used a mirror for visualization in the place of endoscope [6, 7].

Suction diathermy ablation of adenoid has been a popular alternative, reported to be is safe with minimal blood loss [8, 9], however, is slow and has the risk of cicatrisation and burns to surrounding tissue. CO_2 laser also have these disadvantages in addition requires its special precautions [10]. Nasopharyngeal stenosis has been reported following adenoidectomy using a KTP laser [11]. Other methods described are radiofrequency adenoidectomy [12], coblater and use of electronic molecular resonance tool [2].

Power assisted adenoidectomy using a microdebrider is also recently described procedure. Our study is a non comparative, prospective study, in which endoscopic guided adenoidectomy with microdebrider was performed in 38 patients and its merits and demerits were noted. Performing an endoscopic power assisted adenoidectomy, harvests the advantages of both the endoscope as well as the microdebrider.

The use of rigid endoscope or sinuscope has its own advantages. It allows good visualization ensuring complete removal of adenoid tissue without damaging surrounding structures. When used transnasally there is no need to extend the neck especially in patients with instability of cervical spine [5].The technique of endoscopic adenoidectomy has been described using rigid telescope for visualization and forceps for removal of adenoids [10].

The microdebrider has been used extensively for tissue debridement during endoscopic sinus surgery [11]. With endoscopic assisted adenoidectomy with microdebrider good results are seen. Due to suction and shaving action of microdebrider, it can remove the tissue down to less vascular fascial plane. Oscillation cutting action of the blade minimizes the bleeding.

One retrospective review of complete adenoidectomy using microdebrider versus curettes showed that power-assisted adenoidectomy was 58% faster (11 min vs. 19 min) but the blood loss (22 ml vs. 32 ml), recovery time and complications were not

significantly different [3]. A subsequent prospective randomized study showed again that operative time was much less with microdebrider (10 min 13 s vs. 12 min 14 s) and also that blood loss was less with microdebrider (17.5 ml vs. 24.0 ml, 27% less) [13].

Koltai *et al*. [3] in their series bent the shaver blade as per requirement of the nasopharynx. A special adenoid blade with the window with cutting blade on its convex aspect is available to serve the purpose which we used transorally in our study.

In our study, we found the operative time with endoscopic power assisted technique was 20 minutes and blood loss was around 28 ml. We found that the oscillating cutting action of the shaver blade minimizes bleeding and continuous suction helps in maintaining the surgical field clear. Thus enhancing safety Due to the suction and shaving action ,drawing the loose tissue into the blade, tissue can be removed down to a less vascular fascial plane, as opposed to the pushing and cutting action of the curette which may leave bleeding tissue behind. Irrigation while using the microdebrider also aids in quicker haemostasis.

Stanislaw *et al*. [7] found that the tissue dissection was more complete and to the appropriate depth with a microdebrider, as opposed to with a curette where depth is either too deep or shallow. The surgeon satisfaction of plane of dissection was also greater. A prospective study involving endoscopic evaluation of cases operated by curette and microdebrider has shown that, following traditional curette adenoidectomy 39% of patients had residual obstructive tissue which was completely cleared by powered shaver adenoidectomy later [5].

Thus power assisted endoscopic adenoidectomy has following advantages:

- Completeness of adenoid tissue removal to adequate depth and causing no damage to surrounding structures with minimal bleeding.
- Surgeon satisfaction was definitely high. The post operative recovery was satisfactory though a small percentage 5 (13.15%) of patients did complain of neck pain which was relieved by analgesics. These were the first few patients there was some difficulty with hand eye coordination and technique appears difficult but this complaint was not seen in later surgeries.
- Patients who came for long term follow-up do not showed any symptoms or signs of Eustachian tube stenosis.
- Use of microdebrider has a few disadvantages.
- It requires the use of expensive equipment including the cost of blades which require replacement.
- Some authors have noted the difficulty in maneuvering the microdebrider tip into the nasopharynx, especially with a telescope in same side of the nose [4]. This can be overcome by placing the two instruments in different nostrils or transorally.

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