

## Comparison of Septoplasty under General Anaesthesia and Monitored Anaesthetic Care with Dexmedetomidine

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**Abstract:** Septoplasty for the surgical correction of the nasal septum is one of the most common rhinology procedures. This operation can be done under both general anaesthesia and local anaesthesia with sedation. Dexmedetomidine is said to have both analgesic and sedative properties. The aim of this study is to compare the results of monitored local anaesthesia with dexmedetomidine with general anaesthesia in patients undergoing septoplasty to find out the better efficacious anaesthesia for this surgery. 40 patients planned for septoplasty were taken up for this study. 20 patients were operated under general anaesthesia and remaining 20 patients were operated under monitored local anaesthesia with dexmedetomidine. The results were evaluated intra operatively and post operatively for surgical bleed, duration of surgery, haemodynamic stability and complications. Patient's and surgeon's satisfaction and operation cost were also evaluated. The results showed that there was less bleeding, lesser operating time, lesser complications and more haemodynamic stability in patients operated under monitored anaesthetic care with dexmedetomidine than under general anaesthesia. There was better surgeon and patient satisfaction in dexmedetomidine group and it was more cost effective. So it can be concluded that dexmedetomidine is a safe and effective sedative for septoplasty done under monitored local anaesthesia and can be preferred method of choice over general anaesthesia.

**Keywords:** Dexmedetomidine, General anaesthesia, Monitored anaesthesia care, Post operative pain, Septoplasty

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### I. Introduction

Nasal septal deviation is frequently encountered in the general population. The major symptom is nasal obstruction causing difficulty in breathing. Surgical correction of this is being done for over a century. This surgery can be done under general anaesthesia or local anaesthesia with Monitored Anaesthesia Care (MAC). General anaesthesia is time consuming, not cost effective and is associated with many complications. MAC involves administration of local anaesthesia combined with IV sedation, anxiolytics and or analgesic drugs. The ideal anaesthetic method should be non invasive, short, cheap and comfortable for patient and surgeon. Good patient selection, pre operative counseling and use of appropriate sedation are important factors for success of septoplasty under local anaesthesia [1].

Several drugs have been used for sedation during surgical procedure under monitored local anaesthesia including propofol, benzodiazepines and opioids [2]. But these drugs are associated with increased risk of over sedation and respiratory depression which makes these drugs less than ideal [3]. Dexmedetomidine is a highly selective alpha 2 adrenoreceptor agonist which has both sedation and analgesic effect without inhibiting respiration [4]. It is being used since 20 years mainly in sedation of ICU patients who are already intubated.

So this study was planned to compare the results of monitored local anaesthesia with dexmedetomidine with general anaesthesia in patients undergoing septoplasty to find out the better efficacious anaesthesia for this surgery.

### II. Materials And Methods

This prospective randomized study was conducted in Department of ENT of our medical college and hospital from January 2014 to December 2014. 40 patients scheduled for septoplasty whose physical status was 1 or 2 according to American Society of Anaesthesiologist (ASA), aged between 18 to 60 years were enrolled in this study after obtaining written consent from the patients. The approval of local ethics committee was taken. Exclusion criteria were cases of revision surgery, nasal allergy, systemic diseases like diabetes mellitus, hypertension, tuberculosis, bleeding or coagulation disorders, acute infection, pregnant or nursing mothers. All the patients were operated by the same surgeon and anaesthesia (both general anaesthesia and monitored local anaesthesia) was given by the same anaesthesiologist performing this study.

The patients were randomized alternatively into GA group (Group G) and MAC group (Group D) on the basis of computer generated randomization scheme. 20 patients taken in group G were taken up for

septoplasty under general anaesthesia. Remaining 20 patients in group D were taken up for septoplasty under monitored local anaesthesia with dexmedetomidine.

In both groups initially after shifting the patient to pre operative room, IV line maintained with Ringer Lactate (RL) solution 500 cc. Nasal packs soaked with 4% lignocaine with adrenaline were placed in both nostrils of the patient 20 minutes before surgery for surface anaesthesia.

After shifting the patient to operation theatre, in group G for induction of anaesthesia Propofol 2.5 mg per kg body weight was given followed by Nelbuphine 0.1 mg per kg body weight, then endotracheal intubation was performed. The anaesthesia was maintained by oxygen, nitrous oxide and atracurium maintenance dose 0.25 mg per kg body weight. Whereas in group D patients were administered IV dexmedetomidine loading dose 1 microgram per kg over 10 minutes followed by continuous infusion of 0.2 microgram per kg per hour using an infusion pump. If the patient had less sedation in group D, then bolus IV midazolam 0.01mg per kg was administered and diclofenac 75 mg infusion was administered as a rescue analgesic for pain in this group.

In both groups then after removal of nasal packs, infiltration of 2% lignocaine with 1:1000 adrenaline hydrochloride in the mucous membrane of nasal septum at various sites on both sides was administered. During the surgical procedure patient's pulse, heart rate, systolic and diastolic blood pressure, oxygen saturation and ECG were monitored.

The patients were assessed intra-operatively and post-operatively for following –

1. Haemodynamic stability during surgery in both groups.
2. Total operating time and surgical operating time in both groups.
3. Intra operative and post operative bleeding in both groups.
4. Intra operative and post operative complications in both groups.
5. Satisfaction of patient and surgeon in both groups
6. Total operating costs in both groups.
7. Need for rescue analgesic and rescue sedative in group D.
8. Quality of breathing one week after surgery in both groups.

Detailed statistical analysis was done using advanced statistical tools and results were compared in both groups. Pain was measured by using visual analogue scale (VAS). Patient and surgeon's satisfaction was measured by using LIKERT scale. Total operating time was the time that the patient stayed in the operation theatre. Surgical operating time was the time from starting of the local infiltration till the end of surgical procedure.

Intra operative bleeding was defined as minimal, moderate and severe bleeding. Minimal bleeding implies the surgical field was cleared with gauze and no major suctioning was needed. Moderate bleeding implies frequent suctioning was required to clear the surgical area of blood but the bleed didn't threaten the surgical field. Severe bleeding implies that the bleed threatened the surgical field and posed difficulty for the operating surgeon.

### III. Results

Forty patients who had given consent were enrolled in this study. All the patients had undergone the same surgical procedure septoplasty. Data was collected on all patients. All the patients were in the age group of 18 to 60 years. The majority of the patients were in the younger (55%) and middle age group. Only 2 patients were above the age of 50 years (Table 1). Male and Female patients were almost equal (Table 1).

**Table 1** Age and Sex wise distribution

Age Group	Male	Female	Total
18 – 30	12	10	22
31 - 50	8	8	16
51 – 60	1	1	2
Total	21	19	40

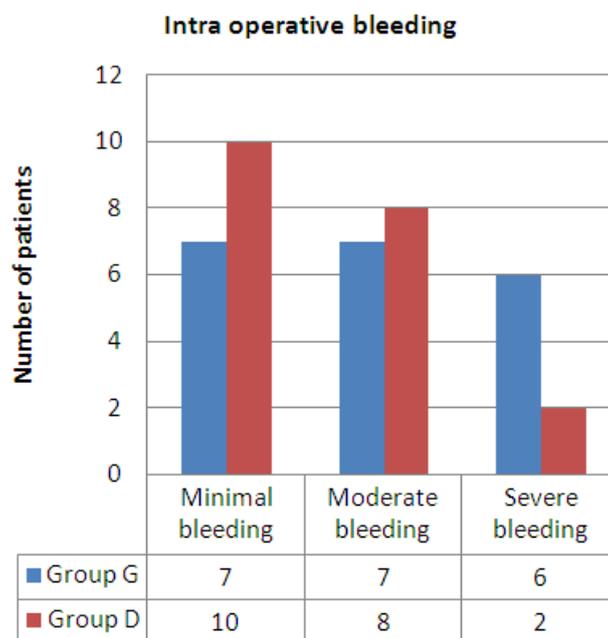
The patients were assessed intra operatively and post operatively and the results were analyzed.

Regarding the haemodynamic stability, heart rate and systolic blood pressure were more stable in group D using monitored local anaesthesia with dexmedetomidine. In group G there was a rise in systolic blood pressure and heart rate after endotracheal intubation but they were more stable in MAC group. There was no difference in diastolic blood pressure or saturation in both groups in our study. There were no major ECG changes in either group. Total operating time and Surgical operating time were much less in the group D than the GA group (Table 2). The average cost of surgery in group D (monitored local anaesthesia) was Rs 700 and was much lesser than group G (general anaesthesia) (Rs 1500). In the group D only 2 patients (10%) needed rescue sedation with midazolam and 3 patients (15%) needed rescue analgesia with diazepam (Table 2). This shows the high efficacy of dexmedetomidine as both analgesic and a sedative.

**Table 2** Intra Operative findings in both groups

S.No	Finding	Group D (MAC)	Group G (GA)
1	Haemodynamic stability	More stable	Less stable
2	Total operating time (average)	41 minutes	70 minutes
3	Surgical operating time (average)	30 minutes	42 minutes
4	Need for rescue sedation	2 patients (10%)	-
5	Need for rescue analgesia	3 patients (15%)	-
6	Total operating cost	Less	More

Regarding the intra operative bleeding, there was more severe and moderate bleeding in group G (65%) than group D (50%) (Fig 1). 6 (30%) patients in group G had severe bleeding which threatened the surgical field and posed difficulty for the surgeon in operating as compared to only 2 (10%) patients in group D (Fig 1).



**Fig 1** Comparative results of intra operative bleeding in both groups

Regarding the post operative complications in both groups, there were more complications of sore throat, nausea, vomiting and post operative active bleeding in GA group (Group G) than in MAC group (Group D) (Table 3). There was equal incidence of dry mouth (30%) in both groups.

Regarding the post operative pain measured using VAS Score, it was calculated as mean with standard deviation. The score of 0 meant no pain and 10 meant severe pain. The mean results showed that the pain was much lesser in group G (Table 3)

**Table 3** Post operative complications

S.No	Complication	Group D (MAC)	Group G (GA)
1	Dry Mouth	6 patients (30%)	6 patients (30%)
2	Sore Throat	3 patients (15%)	6 patients (30%)
3	Nausea	2 patients (10%)	3 patients (15%)
4	Vomiting	0 patients (0%)	1 patient (5%)
5	Post op bleeding	0 patients (0%)	2 patients (10%)
6	Post op pain (VAS Score)	2.24±1.61	3.48±1.61

**Note-** Both groups had total 20 patients each. Data was expressed as number of patients and percentage(%). VAS Score was calculated as mean ± standard deviation

The satisfaction of the patient and surgeon was calculated according to LIKERT scale. Patient satisfaction was enquired 24 hours after surgery at the time of discharge of patient from hospital. The results showed greater surgeon and patient satisfaction in the MAC group (Group D) than Group G using GA. 17 patients (85%) in group D were satisfied or extremely satisfied as compared to 14 patients (70%) in group G (Table 4). Similarly regarding surgeon's satisfaction, surgeon was satisfied with his procedure after operating 18 patients (90%) in group D and 15 patients (75%) in group G (Table 5).

**Table 4** Patient satisfaction results

Result	Group D (MAC) Total patients- 20	Group G (GA) Total patients- 20
Extremely Unsatisfied	0 patients (0%)	0 patients (0%)
Unsatisfied	0 patients (0%)	1 patient (5%)
Undecided	3 patients (15%)	5 patients (25%)
Satisfied	6 patients (30%)	6 patients (30%)
Extremely Satisfied	11 patients (55%)	8 patients (40%)

**Table 5** Surgeon satisfaction results

Result	Group D (MAC) Total operated cases- 20	Group G (GA) Total operated cases- 20
Extremely Unsatisfied	0 cases (30%)	0 cases (0%)
Unsatisfied	0 cases (15%)	1 case (5%)
Undecided	2 cases (10%)	4 cases (20%)
Satisfied	7 cases (35%)	7 cases (35%)
Extremely Satisfied	11 cases (55%)	8 cases (40%)

The quality of breathing assessed 1 week post operatively was almost equal in both groups.

#### IV. Discussion

The efficacy of monitored local anaesthesia with dexmedetomidine as compared to general anaesthesia during septoplasty was investigated in this study. The aim of this study is to compare the results of monitored local anaesthesia with dexmedetomidine with general anaesthesia in patients undergoing septoplasty to find out the better efficacious anaesthesia for this surgery

Septoplasty can be performed both under local anaesthesia and general anaesthesia. Monitored anaesthetic care (MAC) is a technique of administration of local anaesthesia combined with IV sedation, anxiolytics and analgesics. This technique can be applied to septoplasty in which adequate sedation and analgesia without respiratory depression is desirable for comfort of patient and surgeon. The ideal anaesthetic material should be non invasive, short, cheap and comfortable for patient and surgeon. The comparison of different anaesthesia types have been discussed in various studies in literature. The advantages of general anaesthesia (GA) are safe airway, no need for patient's cooperation. The advantage of local anaesthesia are shorter operation time due to no need for endotracheal intubation , mechanical ventilation, extubation, awakening and shorter recovery time. In our study also we found shorter total operating time in MAC group (Table 2).

General anaesthesia also causes more post operative nausea and vomiting due to side effects of endotracheal intubation or inhalation of anaesthesia drug [5]. In our study also we found greater incidence of post operative nausea and vomiting in GA group (Table 3). Recovery from GA results in pain due to elevated catecholamine concentration [6]. Similar results were obtained in our study where post operative pain scores were higher in group G where GA was administered (Table 3). Several drugs have been used for sedation during surgery under local anaesthesia with MAC including propofol, benzodiazepines and opioids. Propofol can cause over sedation, disorientation and cardiorespiratory depression [7]. Benzodiazepines can also lead to over sedation and confusion especially in elderly [8]. Opioids can cause increase risk of respiratory depression and oxygen desaturation [9]. So all of these sedatives are less than ideal for intra operative management of sedation in MAC.

Dexmedetomidine is a selective alpha 2 receptor agonist with properties of both analgesic and sedative without causing major respiratory depression [4]. It has a shorter half life (2 hours) as compared to other sedatives. The analgesic effect is by suppressing the sympathetic nerve system [10]. Goksu et al reported sufficient analgesic effect when dexmedetomidine was used [11]. Karaaslan et al reported less need for tramadol when dexmedetomidine was used as compared to midazolam in FESS and septoplasty [12]. In our study also rescue analgesic was rarely required (15% patients) in group D using monitored local anaesthesia with dexmedetomidine (Table 2).

General anaesthesia leads to increase in blood pressure and heart rate intra operatively whereas dexmedetomidine is more haemodynamic stable. It prevents sudden rise in blood pressure and heart rate [5]. Similar results were obtained in our study. According to a study, the satisfaction of patients was higher in local anaesthesia using dexmedetomidine as compared to GA [6]. Similarly our results showed higher patient and surgeon satisfaction in group D using dexmedetomidine (Table 4,5). Dexmedetomidine is increasingly being used as a sedative for MAC for various surgical procedures [13]. It reduces opioid requirement [9]. In our study we also observed good sedative effect with dexmedetomidine in MAC group as there was hardly any need for rescue sedation intraoperatively (Table 2).

According to a study dexmedetomidine can provide induced hypotension with blood less surgical field [14]. Similarly in our study we found much lesser intra operative bleeding in group D using dexmedetomidine for sedation as compared to GA group. Dry mouth has been reported as a side effect in literature [15]. In our

study we found equal incidence of dry mouth for both GA and MAC (Table 3). Monitored local anaesthesia with dexmedetomidine was found to be more cost effective as compared to general anaesthesia. This is one of the major factor for deciding type of anaesthesia in a developing country.

### **V. Conclusion**

Monitored anaesthetic care with dexmedetomidine is a safe and effective anaesthesia technique for sedation and analgesia during septoplasty. It causes less bleeding, less operative time, less nausea and vomiting, shorter recovery phase, more stable haemodynamic state and higher satisfaction for both patient and surgeon. It is also cost effective as compared to general anaesthesia. It is an effective choice also for those who are not systematically healthy and fit for general anaesthesia. Dexmedetomidine also causes much lesser side effects as compared to other sedatives.

So we can conclude that dexmedetomidine is a safe and effective sedative and analgesic for septoplasty done under monitored local anaesthesia and can be preferred method of choice over general anaesthesia. There is scope of further studies along this line of management.

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### **References**

- [1]. FG, Ferraro RE, Kingsley CP, Fornadley JA. Operative times, postanesthesia recovery times, and complications during sinonasal surgery using general anesthesia and local anesthesia with sedation. *Otolaryngol Head Neck Surg* 2000; 122:560–566.
- [2]. Fedok Eichel R, Goldberg I. Anaesthesia techniques for cataract surgery: a survey of delegates to the Congress of the International Council of Ophthalmology 2002. *Clin Experiment Ophthalmol* 2005; 33: 469-72.
- [3]. Salmon JF, Mets B, James MF, Murray AD. Intravenous sedation for ocular surgery under local anaesthesia. *Br J Ophthalmol* 1992; 76: 598-601.
- [4]. Hall JE, Uhrich TD, Barney JA, Arain SR, Ebert TJ. Sedative, amnestic and analgesic properties of small dose dexmedetomidine infusions. *Anesth Analg* 2000; 90: 699 – 705.
- [5]. Fedok FG, Ferraro RE, Kingsley CP, Fornadley JA. Operative times, postanesthesia recovery times, and complications during sinonasal surgery using general anesthesia and local anesthesia with sedation. *Otolaryngol Head Neck Surg* 2000; 122: 560-566.
- [6]. Candiotti KA, Bergese SD, Bokesch PM, Feldman MA, Wisemandle W, Bekker AY: MAC study group. Monitored anaesthesia care with dexmedetomidine: a prospective, randomized, double blind, multicenter trial. *Anesth Analg* 2010; 110(1): 47 – 56.
- [7]. Janzen PR, Christys A, Vucevic M. Patient-controlled sedation using propofol in elderly patients in day-case cataract surgery. *Br J Anaesth* 1999; 82: 635-636.
- [8]. Weinbroum AA, Szold O, Ogorek D, Flaishon R. The midazolam-induced paradox phenomenon is reversible by flumazenil. *Epidemiology, patient characteristics and review of the literature. Eur J Anaesthesiol* 2001; 18: 789-797.
- [9]. Wong DH, Merrick PM. Intravenous sedation prior to peribulbar anaesthesia for cataract surgery in elderly patients. *Can J Anaesth* 1996; 43: 1115-1120.
- [10]. Aydil U, Yilmaz M, Akyildiz I, Bayazit Y, Keseroglu K, Ceylan A. Pain and safety in otorhinolaryngologic procedures under local anaesthesia. *J Otolaryngol Head Neck Surg* 2008; 37: 851-855.
- [11]. Goksu S, Arik H, Demiryurek S, Mumbuc S, Oner U, Demiryurek AT. Effects of dexmedetomidine infusion in patients undergoing functional endoscopic sinus surgery under local anaesthesia. *Eur J Anaesthesiol* 2008; 25: 22-28.
- [12]. Karaaslan K, Yilmaz F, Gulcu N, Colak C, Sereflican M, Kocoglu H. Comparison of dexmedetomidine and midazolam for monitored anaesthesia care combined with tramadol via patient controlled analgesia in endoscopic nasal surgery: A prospective, randomized, double blind clinical study. *Curr Ther Res Clin Exp* 2007; 68: 69 – 81.
- [13]. Alhashemi JA. Dexmedetomidine vs midazolam for monitored anaesthesia care during cataract surgery. *Br J Anaesth* 2006; 96:722-726.
- [14]. Durmus M, But AK, Dogan Z et al. Effect of dexmedetomidine on bleeding during tympanoplasty or septorhinoplasty. *Eur J Anaesthesiol* 2007; 24: 985-986.
- [15]. Guo TZ, Jiang JY, Buttermann AE, Maze M. Dexmedetomidine injection into the locus ceruleus produces antinociception. *Anesthesiology* 1997; 84: 873–881.