Comparative study between local anaesthesia and general anaesthesia in coblation turbinoplasty

Pavel Straka[1], Pavol Surda[2], Zareena Shah[3], and Eamon Shamil[4]

[1]Charles University Second Faculty of Medicine
[2]Academic Medical Centre Amsterdam
[3]ENT department, Guy's and St Thomas' NHS Foundation Trust, London, UK
[4]Guy's and St Thomas' NHS Foundation Trust

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Key points

- Coblation turbinoplasty is an efficient and minimally invasive treatment for blocked nose due to rhinitis that is refractory to medical treatment
- In UK, turbinoplasty is mostly performed under GA
- LA technique was never compared against GA in terms of impact on quality of life, complication rates, waiting times and length of stay
- Our data suggest that LA and GA techniques have comparable safety profiles, pain scores and quality of life improvement
- LA technique is superior when it comes to shorter waiting times and reduced length of hospital stay.

Introduction

Coblation turbinoplasty is an efficient and minimally invasive treatment for hypertrophic inferior turbinates that cause nasal congestion, obstruction as well as improving nasal blockage, especially in patients who suffer from rhinitis (1).

The procedure is mostly performed under general anaesthesia (GA), but local anaesthesia (LA) is rapidly gaining popularity as it enables the procedure to be performed in the outpatient setting (2-4). This would seem advantageous during the COVID-19 pandemic where the rising number of cancelled elective procedures has led to longer waiting lists (5).

To combat the growing number of patients awaiting their surgery, coblation turbinoplasty under LA became popular at our hospital, from March 2021. We hypothesised it would reduce the time required in the operating room, by instead performing this in the outpatient "office" setting.

Although coblation turbinoplasty under LA has been studied before(3), we did not identify a comparative study to evaluate its safety and efficacy against procedures performed under GA; this formed our main objective. Secondary objectives included determining the impact of quality of life, comparing costs, postoperative pain, length of stay and waiting times of the two anaesthetic procedures.

Materials and methods

In this prospective case-control study, we included patients aged over 18 years who underwent coblation inferior turbinoplasty at our hospital. A total of 42 patients were identified, with 22 treated under LA and 20 treated under GA. Due to the disruption of elective services by COVID-19 pandemic, we included GA patients from the period prior to pandemic (January 2019 to March 2020). LA procedures were performed between March 2021 and January 2022. The inclusion criteria were ASA grade 1-2, chronic non-allergic rhinitis refractory to medical treatment and confirmed with negative skin-prick or RAST test.

All patients 42 completed the study and were followed up in outpatient clinic 3 months after discharge. We measured these outcomes between studied groups: change in overall NOSE scores between pre-operative visit and 3 months postoperatively, pain scores, waiting times for procedure and costs.

Moreover, we wanted to assess the differences in length of inpatient stay. Due to heterogeneity of admission and anaesthetic protocols, we decided to measure time between:

Arrival to outpatient clinic/day surgery admission lounge and discharge home (Total time)

Arrival to recovery and discharge (Recovery time)

We also screened these complications: excessive bleeding requiring re-admission, prolonged stay/insertion of packing/revision surgery for bleeding, infection requiring antibiotics and adhesions at 3 months follow up. The patients were asked to rate their pain postoperatively at 1 hour using visual analogue scale (VAS) (0 = no pain, 10 = most severe pain). Just before discharge, we asked patients included in the LA cohort whether they '*Would you recommend turbinoplasty under local anaesthesia to a friend* ?'. We present the screening algorithm that was used in real-life setting (Figure 1).

This study served as an evaluation of practice and was approved by our Hospital Clinical Governance Department.

Procedure

All surgical procedures were performed by a single surgeon (PS).

Local anaesthesia technique

The operation was performed in outpatient "office" setting. The patient was positioned in a sitting position and LA was initiated with two sprays of Lidocaine Hydrochloride 5% w/v and Phenylephrine Hydrochloride 0.5% w/v Topical Solution into each nostril. After 5 minutes, 2% lidocaine (total amount 2.5 ml) was sprayed onto each inferior turbinate) into two locations (anterior and middle portion) using a Spinal Needle (22g, 90mm)(2, 4). 10 minutes later the operation was started. The patients were discharged one hour postoperatively.

General anaesthesia technique

Patients who underwent general anaesthesia were positioned in reverse-Trendelenburg position, after insertion of laryngeal mask airway, the nasal cavity was irrigated with Moffet's solution (1ml cocaine hydrochloride 10%, 1ml adrenaline 1:1000, 2ml sodium bicarbonate 8.4%, 6ml sodium chloride 0.9%) and inferior turbinates (IT) were injected with Lignospan (Lidocaine HCl. 2% and Epinephrine 1:100,000, total amount 2.5ml). As per hospital protocol, patients were kept for observation in hospital for minimum of four hours and then discharged.

Coblation Turbinoplasty technique

In both groups, Coblation device covered in saline gel (REFLEX ULTRA 45 turbinate reduction wand, Smith & Nephew Arthrocare, London, United Kingdom) was inserted submucosally into the inferior turbinate to the most proximal marker on the wand. Then, we ablated the submucosal tissues at three points (posterior, medial, anterior) using the foot pedal. If required we, repeated the insertion to achieve further reduction of IT. In both groups, we did not use postoperative packing.

Statistical analysis

The Kolmogorov–Smirnov test showed abnormal distribution, therefore non-parametric testing was applied for analysis (SPSS Inc., Chicago, IL, USA). We used a STROBE reporting guideline in order to facilitate critical appraisal and interpretation of results (6).

Results

A total of 42 patients with non-allergic rhinitis who underwent turbinoplasty were included in our study. The participants' mean age in the LA group was 36.9 years ranging from 20 to 52 years and mean age of GA group was 39.1 ranging from 23 to 58 years. In GA group, we recorded one bleeding complication that required insertion of packing. Other respondents' characteristics are shown in Table 1.

Median waiting time for surgery in LA group (median 2 weeks (range 1-5)) was significantly shorter than in GA group (median 18 weeks (range 8-35)) (<0.001). There was no difference in change of the NOSE scores after intervention between LA group (mean -34.5 (SD=-24.3)) and GA group (mean -32.8 (SD=-11.9)) (Table 2) (Figure 2).

In LA group, the proportion of patients who strongly agreed with question 'Would you recommend turbinoplasty under local anaesthesia to your friend?' was found to be 54.5% (n=12). There was no difference in pain scores at 1 hour after the surgery in LA vs GA group (mean 1.5 (SD=1.9) vs. mean 2.3 (SD=2.2)).

Discussion

The COVID-19 pandemic has presented a new challenge, with a prolonged and progressive pressure on waiting times, cancellations of elective procedures requiring restructuring of operating patterns. We showed that waiting time for coblation turbinoplasty in an outpatient setting was 2 weeks and patients for GA turbinoplasty had to wait over 4 months. Moreover, performing turbinoplasty in outpatient settings, enables theatre utilization for complex cases that cannot be done under LA.

Our study adds reliability to previous findings that coblation turbinoplasty in LA can be performed efficiently and safely(3). We did not observe a difference in impact on quality of life, pain scores or prevalence of complications. In the previous study, authors did not include GA as a control group, therefore this is the first control study to directly compare efficiency variables of turbinoplasty in LA vs GA.

Procedure in LA was as efficient in improvement of NOSE scores as GA technique. This is important finding since the turbinoplasty is mostly performed under GA in the UK and one of the reasons might be a fear that the procedure under LA may be less efficient. At the same time, pain scores did not differ between techniques. This agrees with findings of other studies (1, 7-9).

Weaknesses of the study

The main weakness of the study is a small cohort, and therefore it is challenging to draw definite conclusions on safety profile. Moreover, we could not compare length of operating time because of heterogeneity due to induction with local anesthetic. Length of stay was biased by hospital protocol of minimum stay.

Conclusions

Turbinoplasty in local anaesthesia is safe, efficacious and cheap. The main benefits were reduced waiting time and length of stay whilst we observed no increase in complication rates and pain scores when compared to the general anaesthesia technique.

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FIGURES

Figure 1: Screening algorithm that was used in the real-life setting

GA= general anaesthesia

PCR= polymerase chain reaction

MRSA= Methicillin-resistant Staphylococcus aureus

DM= diabetes mellitus

HTN= Hypertension

COPD= Chronic Obstructive Pulmonary Disease

BMI= Body mass index

ESRD= End-Stage Renal Disease

MI= myocardial infarction

CVA= Cerebrovascular Accident

TIA= transient ischaemic attack

CAD= Coronary Artery Disease

Figure 2: Comparison of total NOSE scores in LA and GA groups.

There is a significant difference of total NOSE scores within groups when comparing pre-operative and post-operative measurement (tested using ANOVA, p-values for both groups were <.001).

There is no difference in change of total NOSE scores between groups.

LA= Local Anaesthesia

GA= General Anaesthesia

	LA (n=22)	**LA (n=22)**	**GA (n=20)**	**GA (n=20)**	**p-value#**
Gender (F)	*10 (45%)*	*10 (45%)*	11 (55%)	11 (55%)	**NS**
Age*	37.5 (20-52)	36.9 (9.3)	39 (23-58)	39.1 (10.9)	NS
Waiting time for surgery*	2 (1-5)	2.5 (1.3)	18 (8-35)	18.3 (95)	<0.001
Total time*	115 (90-150)	113.2 (18.1)	480 (6-10)	445.8 (133.2)	<0.001
Recovery time*	60 (60-80)	65.5 (9.1)	370 (360-430)	378.5 (24.1)	<0.001
Costs per procedure (£)*^	645 (0)	645 (0)	1715 (0)	1715 (0)	<0.001
Complication rate (n, %)	0 (0)	0 (0)	1 (5)	1 (5)	NS

*Described in median (range) and average (SD)

Table 1: Demographics of the cohort

LA=Local Anaesthesia

GA=General Anaesthesia

*Described in median (range) and average (SD)

#Intergroup comparisons were tested using Mann Whitney U test for continuous variables. Comparisons of incidences were tested using chi-square test.

minutes) and coblation wand. Costs of GA procedure included pre-assessment tariff, tariff for using day case theatre for one hour, anaesthetics tariff and coblation wand.

	LA (n=22)	LA (n=22)	LA (n=
	Preoperative	Preoperative	Postope
Total scores*	70 (40-90)	69.8 (15.8)	35 (15-6
Nasal congestion or stuffiness*	3 (2-4)	3 (0.9)	2 (1-2)
Nasal blockage or obstruction*	3 (2-4)	3.2 (0.7)	1 (1-3)
Trouble breathing through my nose*	3 (1-4)	2.9 (1.0)	1 (0-2)
Trouble sleeping*	3 (0-4)	2.6 (1.3)	1.5 (0-2)
Unable to get enough air through my nose during exercise or exertion*	2 (0-4)	2.2 (1.2)	1 (0-4)

Table 2: Intergroup comparisons of NOSE scores

LA=Local Anaesthesia

GA=General Anaesthesia

*Described in median (range) and average (SD)

#Intergroup comparisons were tested using Mann Whitney U test.