

Short communication

Pre-operative nasal preparation—nasal packing and spraying compared

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Abstract

Fifty patients were included in a single blind study to evaluate the effectiveness of ephedrine-naphazoline (0.5 and 0.125 per cent respectively) nasal spray as against nasal packing with lignocaine (4 per cent) and adrenaline solution (1:50,000).

Introduction

The use of topical nasal vasoconstrictors prior to any intranasal surgery is essential to obtain a better operative field during surgery. This is usually accomplished by spraying the nasal cavity with lignocaine (four per cent) solution and then, either packing it with a solution of lignocaine (four per cent) and adrenaline (1:200,000) in a cotton wool pack, or applying cocaine spray/paste using cotton tipped probes. Both these methods are time-consuming and uncomfortable to the patients. Moreover, several adverse reactions of these drugs have been reported in the past, a few of which have proved fatal at times (Verlander and Johns, 1981; Stark *et al.*, 1983).

Patients and methods

A total of 50 patients were included in this single blind study. To eliminate the individual differences in the patients pain threshold and anaesthetic factors contributing to bleeding per-operatively, both the methods were tried on the same patient, *i.e.* one side of the nasal passage was sprayed and the other packed, at random.

Each patient was explained the purpose of the study and an informed verbal consent was obtained before the

procedure. One side of the nasal cavity was anaesthetized using a spray of four per cent lignocaine solution and subsequently packed with a one inch wide cotton wool strip soaked in lignocaine (four per cent) Adrenaline (1: 50,000) solution. At the same time, the other side was sprayed twice with ephedrine-naphazoline (strength 0.5 per cent and 0.125 per cent respectively) solution delivered through a plastic atomizer, without anaesthesia (Fig. 1). Before transfer to the operation room, the patient's experience was charted as—no effect (grade 0), mild (grade 1), moderate (grade 2) and severe (grade 3) based on a linear visual analogue scale.

At the time of induction of anaesthesia, the nasal pack was removed by the anaesthetist. Thus, the surgeon was unaware of the side which was sprayed or packed.

The various procedures carried out on the patients are shown in Table I. The operations were performed by Consultant Surgeons and their observations, regarding degree of vasoconstriction and amount of bleeding during surgery, were charted as no effect, mild, moderate or severe (grade 0-3 respectively).

One patient had to be excluded from the study because of almost complete obstruction of the nasal passage due to gross deviation of the nasal septum.

Results

The results of the study have been analyzed as follows:

TABLE I
THE NASAL SURGERIES PERFORMED IN OUR STUDY GROUP

Operation	Number of cases
Antral wash out	50
Septoplasty	28
Inferior turbinectomy	42
Polypectomy	12
Sub-mucous diathermy of inferior turbinates	6
External septo-rhinoplasty	5



FIG. 1

- a) Age: The age of the patients, included in the study, varied from 13 to 55 years with a mean age of 28 years.
- b) Sex: Of the total 50 patients, 42 (84 per cent) were males and eight (16 per cent) females.
- c) Patient's experience
- 1) Pain and Discomfort.
Forty (80 per cent) patients experienced relatively severe degrees of pain in the side that was packed as compared to none on the sprayed side. However, a number of patients 32 (64 per cent) did experience mild discomfort in the latter group.
 - 2) Numbness and a feeling of constriction in the throat of a greater magnitude (grade 3) was present in 29 (58 per cent) patients following pack insertion as compared to none on the sprayed side. Moreover, 33 (66 per cent) patients did not experience this sensation at all, following the nasal spray.
 - 3) Minor vasovagal symptoms such as tachycardia and sweating were observed in only two patients, and were thought to be as a result of lignocaine adrenaline pack.
- d) Surgeon's observations.
- 1) Vasoconstriction: A more effective and uniform vasoconstriction (grade 3) was obtained in 26 patients (53 per cent) on the side that was sprayed as compared to only six patients (12.25 per cent) developing it in the side that was packed. Conversely, 43 patients (87.75 per cent) had mild to moderate degrees of vasoconstriction of nasal mucosa on the packed side as compared to 23 (47 per cent) patients having it on the sprayed side.
 - 2) Per-operative bleeding: Moderate to severe amount of bleeding, during surgery, was present in 38 (76 per cent) patients on the packed side. This is in strong contrast to only 22 (44 per cent) patients having it on the side which was sprayed.
 - 3) Time factor: An average time of 4.25 mins was required to prepare and pack the nasal cavity as against a few seconds to spray it.

Discussion

Pre-operative nasal preparation is essential to minimize bleeding during surgery and obtain a better operative field. Various protocols have been devised but the preferred ones consist of inserting a nasal pack soaked in lignocaine (four per cent)-adrenaline (1:200,000) solution (Craig, 1987) or painting the nasal mucosa with cocaine paste on cotton tipped probes prior to surgery. Both these methods are uncomfortable to the patients and time-consuming for the surgeons. In our series, we compared spraying the nasal cavity as against packing.

A highly significant difference ($P < 0.001$, using chi-square test) existed between the two groups regarding severity of pain and a feeling of constriction in the throat, with both the observations being greater on the side that was packed. This could be attributed to the initial irritant effect of the lignocaine spray required to anaesthetize the nasal cavity prior to pack insertion.

Also, statistically significant differences ($P < 0.001$), in favour of the nasal spray were present in regards to the effectiveness of vasoconstriction of the nasal mucosa as

observed during surgery. Moreover, the shrinkage of nasal mucosa was uniform after the nasal spray. In the side that was packed, vasoconstriction was mainly restricted to the anterior part due to presence of either hypertrophied inferior turbinates or deviation of the nasal septum.

Besides having the advantage of a shorter time duration, it is more cost-effective to spray the nasal cavity as the same atomizer can be used by the patient in the post-operative period.

In the two patients who developed tachycardia, we felt, that it was the result of the adrenaline, even though it intensifies the vasoconstrictor effect, has been associated with cardiac complications, the risk of which is further enhanced by halothane (Pfleiderer and Brock, 1988). Even though we had used a stronger solution of adrenaline (1:50,000), in our study, the use of adrenaline solution in a concentration higher than 1:200,000 may be associated with an increased toxicity with no additional vasoconstrictor effect (Ehlert and Arnold, 1990).

Although preferred by many surgeons, cocaine, can at times produce bradycardia and ventricular ectopics by central vagal stimulation and also result in central nervous system manifestations of euphoria, hallucination and stimulation of vasomotor and vomiting centres. Besides, cocaine being a controlled drug with a high abuse potential, alternative preparations are preferable (Sessler, 1986).

Ephedrine and naphazoline are both powerful vasoconstrictors when used locally on the mucous membrane, the former by its action on α_1 adrenoreceptors (present in capacitance vessels) and the latter by its action on α_2 adrenoreceptors (located in resistance vessels) (Bende and Loth, 1986). Although, ephedrine has similar α and β adrenergic effects as adrenaline (Weiner, 1980), we did not come across any untoward effects of their use in our study group.

Conclusion

A spray of ephedrine and naphazoline is relatively more safe, cost-effective and comfortable to the patient. It also produces uniform effective vasoconstriction and, thus, less bleeding per-operatively. We recommend the nasal spray as a better alternative to nasal packing.

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