

## Prospective study of the use of vasoconstrictor and saline in septal surgery for infiltration

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### Abstract

Vasoconstrictor agents are often used to reduce bleeding and hence improve the operative field in surgery. These agents are potentially dangerous. A trial was undertaken to compare the use of adrenaline 1:80,000 with saline alone as an infiltrating agent in 30 consecutive patients undergoing septoplasty under general anaesthesia. This study, based on a small number of patients can draw no firm conclusions. There are no really dramatic differences between 1:80,000 adrenaline and saline, in terms of blood loss, operative time and the condition of the operative field between the two groups. However, there is a possibility that there are substantial differences which, because of the variability of these outcomes, could not be detected in a study as small as this. It is recommended that a randomized trial involving patients is used to answer the question.

### Introduction

Infiltration with vasoconstrictors is commonly used to reduce bleeding in nasal septal surgery as it is particularly important to have as good a view as possible in the restricted field of the nose. Most vasoconstrictors, however, have deleterious effects when absorbed into the circulation, for example adrenaline may cause cardiac dysrhythmias (Millar *et al.*, 1958). Saline has no known harmful side effect. Only one study has been done to compare two different local anaesthetic and vasoconstrictor combinations in nasal septal surgery. In the study by McClymont and Crowther (1988) lignocaine 2 per cent and adrenaline 1:200,000 was compared with prilocaine 3 per cent with felypressin 0.03 IU/ml. These two combinations have also been compared in studies with skin infiltration in plastic surgery (Klingenstrom *et al.*, 1967) and with scalp infiltration in neurosurgery (Munchow and Kurze, 1966). In the nasal septum lignocaine with adrenaline was a more potent vasoconstrictor but in the skin and scalp there was no significant difference. Cocaine and adrenaline was compared with cocaine alone as a topical agent on nasal mucosa (Pfleiderer and Brockbank, 1988). In the latter study adrenaline was found to intensify local vasoconstriction, thus resulting in a better operating field.

Most surgeons believe that it is an advantage to use a vasoconstrictor to infiltrate the nasal septum prior to surgery. No previous work has been undertaken to compare saline with a vasoconstrictor. This study was designed to compare saline alone with a solution of adrenaline 1:80,000 as the infiltrating agents in septal surgery, and to measure the blood loss, pulse rate, blood pressure, duration of surgery and assessment of the operative field.

### Patients and methods

Informed consent was obtained from 30 healthy adults undergoing septoplasty under general anaesthesia.

The patients received either adrenaline 1:80,000 (Group A) or normal saline (Group B). Six millilitres of each was drawn up into a 10 ml disposable syringe and a 25-gauge needle was used for infiltration. 1:80,000 adrenaline was made up by adding 1 millilitre of 1:10,000 adrenaline to 7 ml saline. Three ml of the infiltrating agent was injected on each side of the septum until the mucosa blanched. The site of injection was 0.5 cm behind the mucocutaneous junction. More force was necessary to inject as the cross sectional area of a 10 ml syringe was much greater than a dental syringe. The syringes were randomized by the nursing staff; therefore, the surgeon was not aware of the agent used. The incision on the septum was made soon after infiltration.

The patient's position on the operating table was approximately 30° head up tilt. The pulse and mean blood pressure were recorded before and during surgery.

Blood loss was measured from the suction apparatus only as this forms the major part of the total blood loss and is the blood obscuring the surgical field. Blood loss was measured and estimated using the technique used by McClymont and Crowther (1988).

100 ml of saline was drawn into the suction apparatus at the end of surgery. The blood loss was calculated using a dilution technique. The patient's venous haemoglobin was checked from a sample drawn just before surgery. The haemoglobin content of the final solution in the suction bottle was also checked. The blood loss was then calculated by proportion. The patient's venous haemo-

globin concentration divided by the haemoglobin concentration of the final solution in the suction bottle will be equal to the blood loss and known volume of saline divided by blood loss.

The surgeon made a subjective assessment of the dryness of the operative field on a scale 1 to 4, where one was very poor and four was very good. All infiltration and surgery were performed by the same surgeon.

## Results

TABLE 1

	Group A (Adrenaline)	Group B (Saline)
Mean blood loss	45.48 ml	41.88 ml
Mean pulse	85.22/min	81.30/min
Mean blood pressure	93.80 mmHg	92.28 mmHg
Duration	27.6/min	27.2/min
Field	2.66	2.86

Student's 't'-test was performed on the above data. There was no statistically significant difference (P 0.5) between the two groups.

## Discussion

Usually a local anaesthetic with a vasoconstrictor is used in a dental syringe for reducing bleeding during septal surgery. There is no advantage in using a local anaesthetic in the nose when surgery is done under general anaesthesia. This study has shown that there is no significant benefit in using a vasoconstrictor for infiltration when compared with saline. It is very important that saline is injected until the mucosa blanches well.

Although nasal mucosa is responsive to catecholamines, the subperichondrial plane is relatively avascular. The saline probably had an effect by raising tissue pressure and causing vascular compression but, in the case of adrenaline, it may be a combination of rise in tissue pressure and vasoconstriction. The mean blood pressure and mean pulse were comparable in both groups.

When lignocaine with adrenaline and prilocaine with felypressin were compared as infiltrating agents in nasal septal surgery (McClymont and Crowther, 1988), they found a highly significant difference between the two agents—lignocaine with adrenaline being superior. In the above study surgery was performed only under a local anaesthetic. Further, the time interval between injecting the agents and making the incision was 10 minutes. The interval was sufficient for the vasoconstrictor to take full effect.

In the present study with both agents the incision was

made soon after injection. This is a common practice when surgery is done under general anaesthesia. The time interval was too short for the vasoconstriction to take maximum effect. This short interval is ideal when saline is injected. In previous studies comparing the two agents in plastic surgery (Klingenstrom *et al.*, 1967) and neurosurgery (Munchow and Kurze, 1966) little difference was shown.

Adrenaline may cause cardiac dysrhythmias and cardiac arrest, particularly with halothane anaesthesia (Johnstone and Nisbet, 1961).

In conclusion, when the incision is made soon after injection there was no significant difference in blood loss, operative time and condition of the operative field with saline or adrenaline 1:80,000 used as infiltrating agent.

A further study should be done giving sufficient time for the vasoconstrictor to take full effect.

## Acknowledgements

I would like to thank Mrs Wengraf for her encouragement in preparing this project, Mr Carter, Mr Smith and Mr Whitehead for allowing their patients to be treated, the anaesthetists, haematologists and theatre staff for helping with this project, and Mr S Robertson and his assistant for working out the statistics.

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**Key words:** Nasal septum