

## Ringer-Lactate solution versus isotonic saline solution on mucociliary function after nasal septal surgery

MURAT ÜNAL, M.D., KEMAL GÖRÜR, M.D., CENGİZ ÖZCAN, M.D.

### Abstract

Irrigation with isotonic saline is one of the most frequently used solutions after nasal surgery. However, the effect of saline solutions on mucociliary clearance is not well known. In a previous study, it was found that isotonic saline solution had a negative effect on ciliary beat frequency but Ringer-Locke solution had no effect *in vitro*. In this study we compared the effects of Ringer-Lactate solution and isotonic saline solution on mucociliary transport time before, and after, nasal septal surgery in patients with nasal septal deviation. We found that patients who used Ringer-Lactate solution as irrigation after surgery had a significantly better mucociliary transport time than the patients using isotonic saline solution ( $p < 0.05$ ). In conclusion, it is better to use Ringer-Lactate solution instead of 0.9 per cent saline solution for nasal irrigation.

**Key words:** Nose; Surgical Procedures, Operative; Nasal Lavage Fluid; Sodium Chloride; Isotonic Solutions

### Introduction

Physicians have recommended nasal irrigation for patients with sinonasal disease and the post-operative period of rhinological operations for more than a century. Clearance of secretions, debris, crusts, reducing the risk of post-operative adhesions, rapid mucosal healing and early symptomatic relief are major objectives of nasal irrigation.<sup>1</sup> Isotonic saline is one of the most frequently used solutions for irrigation after nasal surgery. However, the effect of saline solutions in different concentrations on mucociliary clearance is not well known. According to Boek *et al.*, isotonic saline solution has a negative effect on ciliary beat frequency which is one of the most important parameters of mucociliary clearance in an *in vitro* situation, but Ringer-Locke solution does not affect CBF.<sup>2</sup> In this study, we aimed to determine the effect of Ringer-Lactate solution and isotonic saline solution on mucociliary clearance in the patients who were operated on for nasal septal deviation.

### Materials and methods

Thirty-two patients aged 18 and 61 years (mean 30.3) were selected to participate in the study. Nineteen were male and 13 were female. None of the 32 patients had any history of upper respiratory infection symptoms, allergic rhinitis, smoking, recent medication of systemic or topical sympathomimetics, parasympathomimetics or antihistaminic drugs or any kind of nasal surgery. The main surgical indication was nasal obstruction due to nasal septal deviation. A standard Cottle technique of septo-

plasty was performed on all of the patients under general endotracheal anaesthesia. Bilateral Merocele nasal tamponades were introduced for two days. After the tamponades were removed, the patients were divided randomly and equally in two groups. In Group A, patients used Ringer-Lactate solution (the composition of this solution is 3.1 g sodium lactate, 6.0 g NaCl, 0.3 g KCl, 0.2 g CaCl<sub>2</sub>·2H<sub>2</sub>O in one litre of water) and in Group B isotonic saline solution (NaCl 0.9 per cent) for cleaning the nasal cavities. Both solutions were introduced to the nose with a handheld atomizer four times daily for three weeks. The nasal septum was straight in all cases and no minor or major surgical complications were revealed after the operation. Mucociliary clearance time was assessed by using the saccharin clearance test method.<sup>3</sup> The test was performed pre-operatively as well as three weeks after septoplasty under the same climatic conditions (room temperature 23°C, relatively humidity 60 per cent). The patient was asked to sit head upright and a 5 mg saccharin granule was placed on the medial aspect of the inferior turbinate. The period until the patient noticed a sweet taste was recorded. According to the previous studies, 30 minutes was accepted as the upper limit of the normal multiciliary clearance time.<sup>4</sup> This was evaluated in deviated and non-deviated sides pre- and post-operatively. The effect of treatment was determined for each group using Student's *t*-test and paired samples *t* test. The results were considered to be significant at  $p < 0.05$ .