Introduction

Biodegradable dressings are effective in the treatment of epistaxis. The rate of sponge dissolution can be modified by the use of hydrophilic and hydrophobic agents to accommodate the variable risk factors that contribute to recurrent bleeding.

Methods

The NasoPore® biodegradable dressing is comprised of polyurethane foam (Fig. 1). Four firm 8-cm dressings were submerged in separate open air Petri dishes containing approximately 90 cc of fluid consisting of a hydrophilic (isotonic saline, sodium chloride/sodium bicarbonate) or a hydrophobic (olive oil) solution. The containers were maintained at room temperature. Comparison was made over time between the dressings placed in the same and dissimilar solutions. The dressings were inspected daily and photographed at 60 minutes, 7 days, 14 days, and 21 days. To eliminate mechanical effects the containers were not disturbed, other than to add additional fluid to maintain adequate surface coverage of each dressing. The hydrophilic solution required replenishment every 2-3 days due to greater resorption by the dressing and evaporative effects. The hydrophobic solution was replenished every 4-5 days.

Results

The dressing placed in the hydrophilic solution swelled more rapidly and to a slightly greater degree than the dressing placed in the hydrophobic solution, reflecting different absorptive properties depending upon the fluid environment (Figs. 2A and 2B). The higher density of the oil may have provided greater buoyancy to the sponge. Alternatively, faster absorption of saline by the sponge might have caused the dressing to sink in the hydrophilic solution. After initially remaining its integrity, the rate of sponge dissolution rapidly accelerated in the hydrophilic fluid (Figs. 3A, 4A, and 5A). The dressing exposed to the hydrophobic fluid remained intact throughout the study period (Figs. 3B, 4B, and 5B).

Conclusions

In patients at high-risk for recurrent epistaxis, intra-nasal application of an oil-based, hydrophobic emollient preserves the integrity of a biodegradable dressing longer than a saline-based, hydrophilic fluid. In patients at low-risk for recurrent epistaxis, instillation of a saline solution facilitates dissolution of the dressing. Dissolution of a biodegradable dressing can be modulated by the fluid environment in which the sponge is placed, with hydrophilic solutions hastening disintegration and hydrophobic fluids preserving sponge integrity.

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