

Innovations

Rationalization of the intrablister normal saline injection volume for getting faultless unilocular bulla

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PROBLEM

Even after 2 h of suction, the incidence of incomplete suction blisters is around 20–30% or more. An intra-blister injection of normal saline makes these blisters unilocular. However, the amount of saline to be injected into the blister has yet to be determined for the specific blister.^[1,2] The size of the blister (hemisphere) can help determine how much saline to inject to achieve a uniform blister. Furthermore, it will prevent blister rupture caused by intrablister injection. To overcome this uncertainty and dilemma, a unique approach to intrablister injection based on blister volume is recommended.

SOLUTION

In general, syringes (10, 20 mL) are used to induce suction blisters. The radii of these syringes are about 8 mm and 10 mm, and the optimal volumes of the blisters (fluid-filled hemispheres) are around 1.33 mL and 2.09 mL respectively, as estimated by the formula for the volume of a hemisphere, which is $\frac{2}{3} \pi r^3$ [Figure 1]. For injection, the calculated amount (volume) of normal

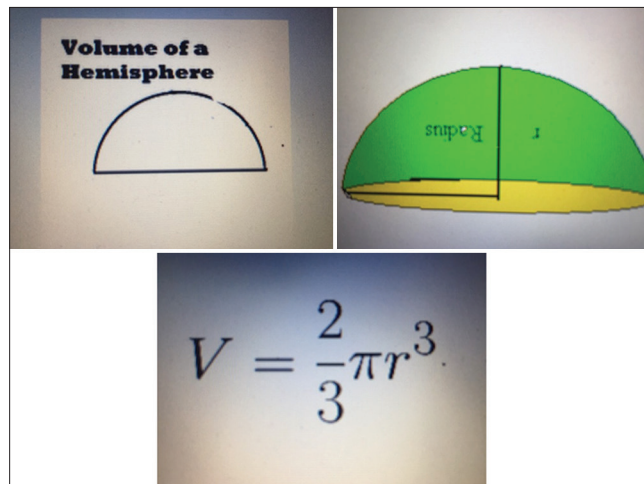


Figure 1: The formula for the volume of a hemi-spherical-shaped suction blister.

saline is withdrawn in a 2 mL or 3 mL syringe. Following that, the blister fluid is withdrawn by the syringe without puncturing the roof of the blister, and the total volume in the syringe is recorded. After that, the calculated volume of fluid is gently reinjected into the blister away from the margin, without puncturing the blister roof. As a result, the appropriate fluid volume needed for the blister produced by 10 mL and 20 mL syringes can be made. The volume of blisters produced by devices having different radii can be calculated with the formula $(2/3 \pi r^3)$ to determine the optimal amount of normal saline for intrablisters injection to obtain a complete, flawless, and unilocular bulla with a lower incidence of blister rupture.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

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