Syringe-based wound irrigating device

Sir,

Wound irrigation is an important aspect of wound treatment, which helps decrease bacterial contamination. The hydraulic forces generated by the stream of fluid acts on the debris on the wound surface and flush it from the wound. In order to remove the wound debris, the force of the irrigation stream has to be greater than the adhesion forces holding the debris to the wound surface. In 1994, Agency for Health Care Policy and Research (AHCPR) recommended a pressure of 10-15 pound per square inch (psi) to be ideal for wound irrigation.[1] Compared to swabbing or bathing, wound irrigation is considered to be most effective in wound cleansing.[2]

Many techniques of wound irrigation are currently in use.[3] Some of these, such as bulb syringe irrigation, deliver low pressure and may not be effective in decreasing bacterial load.[4] High-pressure, pulsatile irrigation devices are expensive, cumbersome, and difficult to keep sterile. A more practical and convenient way to produce pressurized irrigation is to deliver the irrigant from a syringe through a needle or catheter. It has been shown that delivery of saline from a 35-ml syringe through a 19-gauge syringe delivers a stream of irrigant to the wound surface at 8 psi.[5]

Experimentally, we have assessed the pressure generated by combinations of syringes and catheter sizes. In general, as the size of the syringe increases, the pressure decreases because the force applied to the plunger is distributed over a larger cross-sectional area. In contrast, increasing the size of the needle increases the pressure, as there is greater flow. We found that a 20-ml syringe attached to an 18-gauge angiocatheter delivers a stream of irrigant to the surface at approximately 12 psi [Figure 1].

Using this knowledge, a simple device was constructed from materials easily found in the ward. A 20-ml syringe was connected to a plastic tubing of an 18-gauge angiocatheter needle through a “three-way” connector. One inlet of the “three-way” connector was connected to a bag of normal saline on an intravenous (IV) stand. An empty IV fluid plastic bottle was cut by around 10 cm from the tip. The cut was made at an angle of 45°. The tip was then plugged on to the syringe. This funnel-shaped IV bottle piece formed a shield and prevented splash back [Figure 2]. This was important in view of significant risk of contamination with such fluids. It also made the whole process less messy. The oblique cut was made to facilitate a tangential administration of the irrigant. This also helps in easy outflow of the lavage fluid elute through one side from where it was collected into a sterile basin. The patient was positioned such that the lavage elute flow was from the upper end of the wound downward. The fluid (normal saline) was withdrawn into the syringe and the plunger was then depressed to spray the wound with the irrigant. Because of the “three way” connection fluid was sucked into the syringe on withdrawing the plunger. The total volume of irrigant used depended on the size of the wound.

This could make irrigation of wounds more convenient. One drawback of this method is operator fatigue while irrigating large wounds, and it may be better suited for medium- to small-sized wounds.
Recently a question was raised among cleft palate surgeons about the inter-relationship of Age – Weight – Quality of muscle and the ultimate aim in cleft palate surgery – Speech. How often have parents been turned away with a directive from the surgeon - "Your baby is underweight, come back when he weighs 10 kg"?

Now, when we talk about the muscle in relationship to weight, we mention Quality not bulk. Weight may affect bulk, not quality. Quality can only be assessed functionally and not by the eye. (Those of us who have done weight lifting in our youth have noticed time and time again that the well-knit small muscled man out lifts the man with bulging muscles.) Therein lies the importance of QUALITY. The test of Quality is to review the patient six months to a year after surgery and assess how well the palate moves. In spite of excellent movement the speech may still not be what we desired or anticipated. This is because of other factors – length of the soft palate, the distance from the posterior pharyngeal wall, and lateral and posterior pharyngeal wall function. In such cases, the poor speech has nothing to do with the quality of muscles in the palate.

The average weight of our cleft palate children at 1 year of age is 9-10 kg. But we have operated on cleft palate babies with a body weight as low as 5 kg. In every case, irrespective of the weight, we have done a radical dissection and retroposition of the muscle of Veau? We believe that there has been no difference in the speech results of these cases when compared with the ones with a body weight of 9-10 kg.

Now coming to the crux of the matter? Is the weight of the child at the time of surgery of any importance. The answer is Y es and No! It is of no importance from the point of view of Quality of muscle and functional speech results. But it is of immense importance as a P resolution to detect causes for failure to thrive. If the baby is under-weight and fails to thrive in spite of proper feeding, then the clinician must look for a serious systemic disease, and the commonest is a congenital heart condition. The common or garden ones are not easy to miss, but there are the rare ones like the left coronary artery arising from the pulmonary artery instead of the Aorta (A.L.C.A.P.A) which perfuses the left ventricle with cyanosed blood. Such a child may or may not have a murmur but there will always be gross failure to thrive.

Sometime ago we had such a child on our