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The Ultrasonic Bone Aspirator in Endoscopic Dacryocystorhinostomy

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Keywords

• Dacryocystorhinostomy • Endoscopic • Endonasal • Ultrasonic bone aspirator • Nasolacrimal duct obstruction • Sonopet

Key points

- The ultrasound bone aspirator (UBA) is a significant advance in the safe formation of a bony rhinostomy in endoscopic dacryocystorhinostomy (eDCR).
- The UBA can be used to remove excess bone up to the skull base to better expose the common canaliculus through the DCR rhinostomy.
- The UBA is useful in tight spaces when there is a deviated septum or in pediatric patients.

INTRODUCTION

Endonasal endoscopic dacryocystorhinostomy (eDCR) is an alternative to the external approach in lacrimal surgery. It has been shown to be as effective when compared with external DCR (exDCR) [1] and allows the surgeon to spare patients a skin incision. The ultrasonic bone aspirator (UBA), also known as the Sonopet (Stryker Corporation, Kalamazoo, MI), is a major technologic advancement in eDCR surgery. This device is safer than conventional instruments because it can remove bone while minimizing soft tissue injury. This feature is especially critical when approaching the skull base in lacrimal surgery. This article discusses the use of the UBA in lacrimal surgery.

The authors have nothing to disclose.

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EXTERNAL DACRYOCYSTORHINOSTOMY AND ENDOSCOPIC DACRYOCYSTORHINOSTOMY: A BRIEF HISTORY

The concept of a lacrimal-nasal fistulization, or DCR as we know it today, was first described by Toti in 1904 [2]. Before the advent of the endoscope, DCR was performed either externally or intranasally with many limitations due to poor visualization leading to many technical difficulties and risk of injury to adjacent structures [3–6].

The development of endoscopic sinus scopes and newer surgical instruments has led to a revolution in the treatment of sinus disease and more recently in the treatment of lacrimal drainage problems. With the introduction of the rigid endoscope, intranasal lacrimal surgery regained popularity as the previous limitations were addressed because of better visualization [7–9]. eDCR has several advantages over the external approach (exDCR). Most importantly, no external scar is created on the face. Furthermore, endoscopic visualization of the lacrimal outflow and adjacent intranasal structures are better appreciated. This is especially critical when a turbinectomy or septoplasty is required to assure surgical success [1].

The surgical instruments used for conventional eDCR include standard Kerrison rongeurs [4,10], microdrills [11], radiofrequency units [12], and laser [13,14]. A relatively new surgical device useful for this procedure is the UBA with a piezoelectric handpiece (Sonopet, Stryker, Kalamazoo, MI). This device, developed initially for neurosurgical procedures, is a breakthrough in eDCR surgery because it is a more controlled and precise instrument than the traditional instruments for the cutting of bone while minimizing adjacent soft tissue injury.

THE ULTRASONIC BONE ASPIRATOR: AN OVERVIEW

The UBA, also known as the Sonopet (Stryker Corporation, Kalamazoo, MI), was first introduced in Japan in 1974 as a neurosurgical device. In 2002 this device gained approval from the Food and Drug Administration and was brought to the United States. The device consists of a console (Fig. 1A), a hand piece (Fig. 1B, C), and a tip (Fig. 2). The console is the main control box with switches for ultrasonic power regulation, suction, and irrigation. Two types of handpieces, straight and angled, are available. The universal straight handpiece is available in 25 kHz power, and the universal angled handpiece is available in either the 34 kHz or the 25 kHz ultrasonic power.

The 25 kHz universal straight and angled handpieces accept both soft tissue ablation tips and bone dissection tips. Of interest to the lacrimal and orbital surgeon is the bone cutting property of the device, and the 25 kHz power is used for that purpose. The use of the universal angled handpiece is best suited for tight intranasal spaces to allow for the simultaneous use of a straight, rigid endoscopic camera and better visualization and access to the lacrimal bone. Several bone-cutting tips are available, but of most utility in lacrimal surgery are the Spetzler Claw (Stryker Corporation, Kalamazoo, MI) (Fig. 2A) and the Payner 360 (Stryker Corporation, Kalamazoo, MI) (Fig. 2B).