Salivary Gland Lithotripsy: An Non-Invasive Alternative

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Abstract:

Shock wave lithotripsy is minimally invasive & alternative to surgery for treatment of symptomatic salivary stones. Lithotripsy uses shock waves generated outside the body to pulverize or crush the stone inside the body. The purpose of this treatment is to disintegrate the salivary stone into concentration smaller than 2mm to permit spontaneous or induced salivation to flush it out. The aim of this article is to throw light on salivary gland lithotripsy procedure.

Key Words: Sialolithiasis, Shock wave Lithotripsy, Lithotripter.

Introduction:

Sialolithiasis is the formation of salivary stones due to crystallization of minerals in saliva. It can cause blockage of salivary ducts and result in painful inflammation or saladenitis of the salivary gland. It is less common in parotid gland. (Fig. I)

Fig. I: CT scan showing Salivary calculi

Stones can be washed out by stimulating increased salivation using sialogogues combined with gland massage and if necessary, bougienage of the secretory duct using canula. When these methods are unsuccessful and the stones are close to the opening of the main salivary duct, it may be possible to extract them after dilatation or dissection of the duct.

However, while there is no problem in opening the secretory duct of submandibular gland up to the hilus area, while slitting the secretory duct of parotid is risky due to the potential scarring and stenosis. In cases where duct slitting is not feasible, the other option is sialo-adenectomy or surgical removal of the entire gland. Surgery, however, carries risks such as the possibility of injury to facial nerve, lingual nerve and hypoglossal nerve or the occurrence of Frey’s syndrome (Baumash, 2004).

Extra-corporeal shock wave lithotripsy (ESWL) is proposed as a minimally invasive alternative to surgery for treatment of systematic salivary stones. ESWL has been available since 1980 for the treatment of urinary stones; in the mid 1980’s the technology was applied to gallstones (DeBurgh Norman & McGurk, 1995).

Extra-corporeal shock wave lithotripsy uses shock waves generated outside the body to pulverize or crush the stone inside the body. The purpose of this treatment is to disintegrate the salivary stone into concentrations smaller than 2mm to permit spontaneous or induced salivation to flush out the sandy material (DeBurgh Norman & McGurk, 1995).

Procedure:

A lithotripter (Minilith SL-1, Stroz Medical, Kreutzlingen, Switzerland) in which a small diameter cylindrical electromagnetic source generates pressure waves that are focused on the stone through a latex membrane-covered water cushion by means of a parabolic reflector (Fig. III & II). The shock-wave focus of 2.4mm allows the treatment of stones with a diameter of > 2mm. Continuous ultrasound (US)
recordings through an in-line transducer (7.5 MHz) positioned along the longitudinal axis of the reflector allow the waves to be precisely directed at stone and monitor stone disintegration. The residual sand-like material is generally flushed out spontaneously or by means of citric acid-induced salivation. Complete treatment usually requires a mean of five weekly 30-minute sessions, and is followed by clinical and US examinations after 1 week and then after at 1, 3, 6, and 12 months (Capaccio et al, 2002).

Immediate side effects (mild pain, gland swelling, self-limiting duct bleeding, and cutaneous petechiae) sometimes occur (Capaccio et al, 2002).

Following lithotripsy, sialogoues and/or gland massage often are recommended to encourage expulsion of fragments via the duct (Siddiqui, 2002).

Fig. II: Lithotripsy machine for Salivary Calculi

Fig. III: Diagramatic representation of shock waves propagation

**Bibliography:**


**Conclusion:**

In conclusion, the management of salivary calculi by using minimally invasive techniques is becoming a more realistic approach. It is a simple, inexpensive and low morbidity outpatient procedure (Siddiqui, 2002).