Sonopet

- Analysis of the Sonopet Ultrasonic Bone Aspirator to Traditional Instrumentation for Endoscopic Suturectomy for Craniosynostosis
- Outcomes of surgical resection of sphenoid-orbital meningiomas with Sonopet ultrasonic aspirator
- Navigated Ultrasonic Osteotomy to Aid in En Bloc Chordoma Resection via Spondylectomy
- Ultrasonic aspiration in neurosurgery: comparative analysis of complications and outcome for three commonly used models
- Hand-Held Thulium Laser Fiber and Ultrasonic Aspirator for Opening the Internal Auditory Canal During Acoustic Neuroma Microneurosurgery: Operative Technique
- Microsurgical Clipping of Ophthalmic Aneurysms in an Endovascular Era: Sonopet-Assisted Intradural Clinoidectomy and Other Tenets
- Microsurgical Resection of a Ventral Pontine Cavernoma via Supratrigeminal Zone by Anterior Transpetrosal Approach: 2-Dimensional Operative Video
- Utility of an Ultrasonic Aspirator in Transcanal Endoscopic Resection of Temporal Bone Paraganglioma

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The **Sonopet** is an ultrasonic aspirator developed by Stryker, designed for fragmenting, emulsifying, and aspirating both soft and hard tissues during surgical procedures. It combines ultrasonic vibration with integrated irrigation and aspiration, allowing for precise and controlled tissue resection.

Key Features

1. **Sonopet iQ**: The latest version includes Pulse Control technology, which regulates the resection of hard and soft tissues, reduces cutting site temperature, and enhances precision.

2. **Versatility**: Compatible with a wide range of tips using a single handpiece, making it suitable for various surgical specialties.

3. **Applications**: It is commonly used in neurosurgery, orthopedic surgery, and spinal procedures, providing surgeons with advanced tools for safer and more efficient tissue removal.

For more information, visit:

- [Stryker Sonopet iQ Official Page](https://www.stryker.com/es/es/nse/products/sonopet-iq/index-eu.html)

- [Neurosurgical Europe](https://neurosurgical-europe.stryker.com/sonopet-iq)

Prospective cohort studies

Henzi et al. analyzed data from a prospective patient registry. Procedures using one of the following UA models were included: Integra® CUSA, Söring®, and Stryker® Sonopet. The primary endpoint was morbidity at discharge, defined as significant worsening on the Karnofsky Performance Scale.

Secondary endpoints included morbidity and mortality until 3 months postoperative (M3), occurrence, type, and etiology of complications.

Of n = 1028 procedures, the CUSA was used in n = 354 (34.4 %), the Söring in n = 461 (44.8 %), and the Sonopet in n = 213 (20.7 %). There was some heterogeneity of study groups. In multivariable analysis, patients in the Söring (adjusted odds ratio (aOR) 1.29; 95 % confidence interval (CI), 0.80-2.08; p = 0.299), and Sonopet group (aOR, 0.86; 95 % CI, 0.46-1.61; p = 0.645) were as likely as patients in the CUSA group to experience discharge morbidity. At M3, patients in the Söring (aOR, 1.20; 95 % CI, 0.78-1.86; p = 0.415) and Sonopet group (aOR, 0.53; 95 % CI, 0.26-1.08; p = 0.080) were as likely as patients in the CUSA group to experience morbidity. There were also no differences for M3 morbidity in subgroup analyses for gliomas, meningiomas, and metastases. The grade (p = 0.608) and etiology (p = 0.849) of postoperative complications were similar.

Conclusions: Neurosurgeons select UA types with regard to certain case-specific characteristics. The safety profiles of three commonly used UA types appear mostly similar [1].

Retrospective cohort studies

Imahiyerobo et al. assessed the safety and efficacy of the Sonopet Ultrasonic Bone Aspirator (UBA) (Stryker, Kalamazoo, MI) for endoscopic suturectomy compared to traditional instrumentation.

It is a retrospective chart review of consecutive endoscopic suturectomies performed from 2011 to 2019 at Weill Cornell Medical Center, including demographics, cephalic index, surgical indications, operative time, cosmetic and functional results, complications, estimated blood loss (EBL), re-operation rate, length of stay, and length of helmet therapy. These variables were then compared between the Sonopet and non-Sonopet cohorts.

Of the 60 patients who underwent endoscopic suturectomy, 16 cases (26.7%) utilized the Sonopet. Mean operative time was 2.8 ± 0.4 hours in the Sonopet group, compared to 3.2 ± 1.2 hours (P = 0.05) without the Sonopet. EBL was 17.8 ± 23.9 cc versus 34.7 ± 75.5 cc (P = 0.20) with versus without the Sonopet respectively. Length of stay and duration of helmet therapy were similar in both groups, ranging from 1 to 3 days (P = 0.68) and 7.25 to 12 months (P = 0.30) respectively. There were no reoperations in the Sonopet group with a mean follow up of 9.18 months. There were 3 reoperations in the non-Sonopet group with a mean follow up of 11.3 months. Among the cases utilizing the Sonopet, 13 (81%) were metopic and three (19%) were coronal synostoses. Of the non-Sonopet cases, 27 (61%) were sagittal, 8 (18%) were metopic, 7 (16%) were coronal, and 2 (5%) were lambdoid synostoses.

The use of the Sonopet resulted in a mean decrease in operative time (P = 0.18). Lower EBL and reoperation rates with comparable LOS and helmet therapy duration were also seen. This modality should be considered a safe and effective adjunct in appropriate endoscopic craniosynostosis cases [2]

Retrospective case series

A retrospective chart review was conducted in seven patients with spheno-orbital meningioma in a single institution who underwent surgical resection with the Sonopet®. Pre-operative and post-operative data included the assessment of visual acuity, relative afferent pupillary defect (RAPD), Ishihara score, proptosis, fundus examination, computerised visual fields and the presence or absence

of diplopia, headache, and other neuro-ophthalmic complications.Results: Nine Sonopet®-assisted procedures were performed on seven patients. Post-operatively, 89% of cases had stabilization or improvement of visual acuity and colour vision, whilst 29% had improved visual fields with the remainder being stable. Proptosis improved in all patients. Five of nine cases (44%) had new post-operative cranial nerve palsies, of which 75% were transient. One patient had tumour recurrence after 14 months, requiring further tumour resection and radiotherapy.Conclusion: Sonopet®-assisted resection of spheno-orbital meningiomas has comparable outcomes of visual improvement and complication rates to traditional resection techniques. Longer periods of post-operative observation and follow-up are recommended to observe long-term benefits [3].

Case reports

Detchou et al. describe total en bloc resection of a lumbar vertebral body chordoma via the first documented approach of navigated ultrasonic osteotomy for spondylectomy. The patient is a 43-year-old man with end-stage renal disease, requiring dialysis, secondary to diabetes mellitus. The lesion in question was incidentally discovered in the L5 vertebral body during full body scanning for evaluation for a renal transplant. The lesion was diagnosed as a chordoma via percutaneous coaxial needle biopsy. Allogeneic renal transplant was canceled pending treatment of this newly discovered lesion. A combined, staged approach of L3-pelvis posterior instrumented fusion, L5 laminectomy and spondylectomy, and anterior L5 cage reconstruction with L4-S1 fusion was planned. Intraoperative computed tomography scan was performed and stereotactic osteotomies were planned. Ultrasonic osteotome (SONOPET Ultrasonic Aspirator) was registered as a navigation tool and employed, after verification, to complete the posterior stereotactic osteotomies, with postoperative computed tomography, magnetic resonance imaging, and pathology demonstrating successful en bloc resection. The navigated osteotome provided a critical combination of surgical precision and efficiency intraoperatively.

This approach offers a promising technological adjunct for the treatment of complex spine tumors requiring precise resection and reconstruction [4].

Technical note

Mastronardi et al. illustrate the operative technique used on a surgical series of 111 cases operated on during the past 8 years, from July 2010 to July 2018. They studied 170 consecutive patients suffering from ANs who were operated on with a microsurgical technique by the key-hole retrosigmoid approach. In 111 cases the “Sonopet” Ultrasound Aspirator was used to open the IAC and a 2μ-Thulium laser fiber was used for cutting the dura mater of the posterior aspect of petrous bone and the IAC, and it was also used to perform tumor capsule incision. From December 2017 we started to check the removal of tumor inside the IAC with a flexible endoscope 4 mm × 65 cm, (Karl Storz GmbH, Tuttlingen, Germany) in order to detect possible tumoral residue and achieve a radical tumor resection in the fundus. The use of these new technologies seems to be safe and subjectively facilitates the opening of the IAC in AN microsurgery [5].

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