Introduction

Obstructive sialadenitis is the most common non-neoplastic salivary disorder; etiologies include salivary stones, scar tissue, mucoid debris, anatomic ductal abnormalities, neoplasms, strictures, or foreign bodies. 66% of cases are caused by salivary stones, termed sialolithiasis. Approximately 78-87% of stones occur in the submandibular gland with 10-21% in the parotid gland and 1-7% in the sublingual and minor salivary glands. Obstruction leads to local tenderness of the salivary gland especially before meals with episodic swelling. Although conservative approaches can alleviate symptoms, some patients will have recurrences. Until about 20 years ago, sialadenectomy was the procedure of choice for refractory cases to eradicate obstructive symptoms, with risks of facial or lingual nerve injury as well as cosmetic and salivary function impairment.

The current alternative to sialadenectomy is sialendoscopy; advantages include simultaneous diagnostic and interventional capabilities to identify and treat salivary ductal diseases in a minimally invasive manner. Moreover, it provides symptomatic relief while preserving the salivary gland and its function. Common techniques used to remove salivary stones are a grasping technique, a small wire basket retrieval system, mechanical fragmentation, and laser fragmentation. In addition to salivary stones, other common indications for sialendoscopy include diagnostic evaluation of refractory sialadenitis associated with ductal stenosis, radioiodine therapy, Sjogrens, recurrent juvenile parotitis, or intraductal masses. Large stone size is the main cause of surgical failure, especially if they are attached to the ductal wall. Leurs et al. reported that stone mobility was the best predictor of success. The next best predictor is the location, as a stone located proximally, close to the hilum of the gland, is much more difficult to retrieve.

Although sialendoscopy has been proven to be an effective alternative to sialadenectomy for recurrent sialadenitis, there is a surprising poverty of data published supporting the utilization of general versus local anesthesia plus sedation during the procedure, as many of the published studies do not indicate which of the two anesthetic techniques was used.

Figure 1a: A narrowed stricture identified in the parotid duct.

Figure 1b: The stricture has been widened via balloon dilation.

Figure 2a: The scope is passed beyond a small 4mm stone in the submandibular duct.

Figure 2b: A wire basket is opened and retracted along with the stone.

Objectives

1. Evaluate the feasibility of utilizing conscious sedation for interventional sialendoscopy procedures of the parotid and submandibular ducts.
2. Compare success rates to similar procedures that did not indicate general versus local anesthesia.

Study Design and Methods

An observational study was performed on patients with recurrent parotid or submandibular sialadenitis for which they underwent sialendoscopy in the Operating Room from October 2010 to October 2012. Inclusion criteria involved cases that were not planned for conscious sedation. Success was defined as either an uncomplicated stone removal or for non-stone sialadenitis, successful dilation and identification of pathology all utilizing conscious sedation, without having to convert to general anesthesia. Other variables measured include diagnosis, stone size, and additional operative techniques.

Results

Inclusion criteria were met for 60 procedures; 55% for the parotid gland and 45% for the submandibular. 65.9% of patients were female. The average age was 56.0 ± standard deviation 17.3 years. 34.1% of cases were diagnosed with sialolithiasis; of these 93.8% were in the submandibular gland, 25% required YAG laser lithotripsy, and 37.5% required a combined approach via ductal incision.

Procedures were successful in 86.7% of cases; 5% required conversion to general anesthesia, 5% failed duct cannulation, and 3.3% failed stone removal. The first patient that required conversion to general anesthesia presented with a 7 mm parotid stone within an atrophic and irritated duct and reported discomfort once the basket retrieval system was deployed. Another patient had a history of multiple sialendoscopies with exuberant debris in the submandibular duct and could not be kept still in the Operating Room. The third patient required sialadenectomy after failed lithotripsy of a 7 mm stone located posteriorly in the submandibular duct. The 5% of cases that failed duct cannulation included 2 parotid and 1 submandibular case. The 3.3% of cases in which stones were unsuccessfully removed included a 4.7 mm submandibular stone deeply impacted in the gland and a 7 mm stone located posteriorly in the submandibular duct.

Complications of the procedure were rare at 3.3% of cases and mild. In the first, the stone could not be removed after attempted laser lithotripsy, so subsequent sialadenectomy was performed. The other included possible ductal injury after laser utilization; after the stone was fractured into multiple pieces there appeared to be false tracking within the submandibular duct. There was no repair performed and the patient recovered without any postoperative sequelae.

Discussion

Conscious sedation offers many benefits when compared to general anesthesia including less nausea and cardiopulmonary disturbances, quicker recovery, and more patient control (e.g. awake and can follow commands). There would also be greatly increased economic efficiency and convenience if the procedure could be completed outside of the Operating Room or without the supervision of an anesthesiologist.

To analyze the efficacy of sialendoscopy performed with conscious sedation, we compared the success rates in our observational study to those reported in the literature that did not indicate the use of local versus general anesthesia. A meta-analysis of 29 studies involving 1,213 patients exploring the efficacy of sialendoscopy revealed a success rate of 86% (95% CI of 83-89%). In interventional sialendoscopies with stone removal, very experienced surgeons such as Nahtli et al. reported success rates of 86% for parotid and 89% for submandibular sialoliths, on a total of 736 procedures. Our observed total success rate of 86.7% with local anesthesia and conscious sedation alone is very similar to these published reports on sialendoscopy performed with non-indicated local or general anesthesia.

The 5% of cases that had to be converted to general anesthesia due to discomfort included patients with an atrophic and irritated duct, exuberant ductal debris, or an adherent, distal sialolith. The two sialoliths that could not be successfully removed were also due to anatomic difficulties, located in the submandibular gland and near the hilum. From our experience, we recommend considering sialendoscopy with general anesthesia for patients presenting with anatomic difficulties such as distal sialoliths near the gland’s hilum, anticipated long procedures, or if the patient requests.

To avoid bias and to further compare the two techniques, it would be more desirable to design a randomized prospective study with patients undergoing sialendoscopy with general anesthesia versus conscious sedation. Heart rate and blood pressure intra-operatively could be recorded as well as patients’ response to how they subjectively tolerated the procedure. It would be desirable to standardize the way subjective pre- and post-operative symptoms are recorded, such as a questionnaire noting patients’ discomfort, swelling, infection, frequency of pain, and quality of life. Future studies should also analyze the procedure performed in the office setting.

Conclusions

This observational study of sialendoscopy performed with conscious sedation has success rates similar to those reported in the literature that did not indicate the use of local versus general anesthesia. Therefore, it seems that sialendoscopy with conscious sedation is very feasible in properly selected patients, although further studies may further analyze efficacy, determine more precise indications, and compare the settings of outpatient clinic to operating room.

References