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Otolaryngology -- Head and Neck Surgery 2011 144: 294 originally published online 29 December 2010
DOI: 10.1177/0194599810390475

The online version of this article can be found at:
http://oto.sagepub.com/content/144/2/294
Ethiodol Extravasation during Sialography

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No sponsorships or competing interests have been disclosed for this article.

Keywords
sialography, Ethiodol, extravasation, sialendoscopy

Received August 26, 2010; revised October 6, 2010; accepted October 15, 2010.

Conventional sialography is an effective technique to diagnose salivary gland pathology. In many centers, magnetic resonance imaging and computed tomography (CT) have replaced sialography as the primary diagnostic imaging modalities of the salivary glands. However, the recent advent of sialendoscopy has increased the indications for sialography given its superior capacity for precise preoperative localization of pathology such as microstones, mucus plugs, stenoses, and strictures.\textsuperscript{1} Herein, we present a previously undocumented complication of soft-tissue extravasation of Ethiodol (Savage Laboratories, Melville, NY) during sialography. This study is approved by the Indiana University Medical Center Institutional Review Board for a case review.

Case Report
A 49-year-old man presented to the authors with swelling in the right cheek after a parotid sialogram. The sialogram had been performed using 2 mL of Ethiodol under fluoroscopic guidance. The fluoroscopic x-ray showed no ductal or parenchymal filling, but immediate and unexpected pooling of contrast had occurred in the buccal soft tissues. At that point, the procedure had been terminated. Dehiscence or disruption of Stensen’s duct with Ethiodol extravasation was the presumed diagnosis.

To further investigate the contrast extravasation, fluorography and a facial CT scan with IV contrast were performed. Both imaging modalities demonstrated a parotid duct fistula with high-density contrast material abnormally filling the right buccal and masticator spaces (Figures 1 and 2).

To remedy the contrast extravasation, the patient was placed on oral cephalosporin antibiotics, and the body’s reaction to the contrast was clinically monitored. Within 10 days, several localized collections appeared within the soft tissues of the cheek. After 3 weeks, these increasingly well-demarcated sites became abscesses and were drained. The drainage demonstrated oily content without a purulent component and appeared to be Ethiodol having migrated to the skin surface. The soft tissues healed completely without further abscess formation or symptoms over an 11-month follow-up period.

Discussion
Capry first described sialography in 1904, and it has been used as a technique for diagnosing salivary gland pathology ever since.\textsuperscript{2} During sialography, iodinated contrast agents are used. Ethiodol contains 37% iodine in a poppy seed oil base. Its oily composition and low viscosity allow sharp visual

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delineation of ductal walls without ductal permeation and with minimal absorption. If extravasation occurs, these same properties also result in poor elimination of Ethiodol from soft tissues. Once in the tissues, the oily contrast material is first phagocytized by polynuclear giant cells followed by metabolism by esterases, leaving a residue of sodium iodide. The sodium iodide may trigger a foreign-body reaction.

A review of the medical literature reveals no documented reports of extravasation of Ethiodol during sialography, although extravasation of Ethiodol has been documented as a complication of lymphangiography of the foot in efforts to visualize pelvic lymph nodes. Extravasation of the contrast agent from a weakened or obstructed duct can occur even in the hands of an experienced sialographer. Sialographers can minimize the consequences of oily contrast extravasation by using an alternative water-soluble agent such as Sinografin (Patheon Italia SpA, Ferentino, Italy). However, the water-soluble agent is visible for only several minutes after injection and causes a relative “fuzziness” in the image compared with the oil-based agent. Thus, Ethiodol may be more useful for most cases than Sinografin despite a somewhat greater risk.

It is noteworthy that the 37% iodine content of Ethiodol is a powerful antibacterial agent. By comparison, tincture of iodine has 3% iodine content. Perhaps because of the antibacterial activity, the contrast agent extravasation in this particular patient was confined to isolated collections of sterile oil.

Oil-based iodinated contrast agents can also be valuable in the treatment of juvenile recurrent parotitis. Some current regimens include oily contrast infusion of the ducts after cleansing flushes with saline. The long-term retention of the oily iodinated agent within the ducts may contribute to the treatment effectiveness.

From this case, it appears that extravasated iodinated oil leaves the duct and initially collects as a phlegmon within the tissues. The tissue responds by gradually organizing the phlegmon into oil-filled subcutaneous sterile abscesses. The well-circumscribed abscesses are well suited for a surgical drainage procedure. The sterile abscesses were an easier target for surgical drainage than the phlegmon, and their drainage led to resolution of the Ethiodol extravasation.

**Author Contributions**

Peter N. Schilt, data collection, literature search, paper design, writing; Michael H. Fritsch, data collection, literature search, editing, final approval.

**Disclosures**

**Competing Interests:** None.

**Sponsorships:** None.

**Funding source:** None.

**References**