The Branchial Cleft Fistula: Use of a Fistulogram and Guide Wire to Facilitate Complete Removal. A Review of 5 Cases

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Abstract

Branchial cleft anomalies occurring in the pediatric population can present a challenge. With the presentation of a pit along the anterior border of the sternocleidomastoid muscle, it is not possible on physical examination alone to determine the extent of the tract. This paper will look at the use of a preoperative fistulogram to determine the extent of the tract and the utility of intraoperative guide wire placement through the fistula tract to assist in complete removal, even through a small incision. This paper will review 5 pediatric patients, ranging in age from 15 months to 12 years, who presented with a fistula opening at the anterior border of the sternocleidomastoid muscle. Intermittent drainage was noted from the neck. The patients had a preoperative fistulogram (figure 1), and in all 5 cases, dye was noted to drain from the cutaneous opening in the neck to the oropharynx in the tonsillar area. At the time of surgery, a guide wire was placed with fluoroscopic assistance (figures 2,3). In 4 of the 5 cases, the wire traveled from the opening in the neck all the way into the oral cavity. In 1 case the wire stopped at the pharynx, just short of the oropharynx. In children with a draining opening along the sternocleidomastoid muscle, a preoperative fistulogram has been found to better determine the extent of the tract. Additionally, in the cases of a complete fistula, preoperative placement of a guide wire through the fistula helps to facilitate complete removal with the smallest incision possible (figures 4,5,6).

Introduction

Branchial cleft anomalies most often present as a small pit along the anterior border of the sternocleidomastoid muscle. Even with recognition, there is an inability to determine on physical examination alone the extent of the tract or even if a tract is present. Without further investigation, it is unknown if the tract extends for only a few millimeters, or if it extends all the way from the cervical skin, through the deep tissue of the neck, and exits at the tonsillar area. This paper will look at small series of patients who presented with such a pit. Each patient had a fistulogram performed by the Radiologic Department revealing a tract that extended from the cervical skin, through the soft tissue of the neck, and exiting in the tonsillar area. Based on this preoperative assessment, the patients then had a guide wire placed intraoperatively on the day of surgery to facilitate complete tract removal.

Results

In total, 5 children were included in the study for review ranging in age from 15 months to 12 years. The preoperative fistulogram confirmed that the fistula extended from the cutaneous cervical pit, through the deep tissues of the neck, with extravasation of dye into the oral cavity in the area of the tonsil. On the day of the surgical excision, the children had placement of a guide wire under fluoroscopic guidance. In 4 of the cases, the guide wire was able to be threaded all the way through the fistula tract and retrieved through the mouth. In one instance, the guide wire was able to be threaded through the fistula until the area of the pharyngeal mucosa. The guide wire was kept in place during the cervical approach to facilitate removal of the tract (figures 4,5,6).

Discussion

Children who present with a pit along the anterior border of the sternocleidomastoid muscle should have a high index of suspicion for a branchial cleft anomaly including a branchial cleft fistula. Unfortunately with physical examination alone, one is unable to determine if there is any communication into the underlying soft tissue, and if a tract is present, if this is a sinus tract that extends only subcutaneously, if it is a sinus tract that extends into the deeper portions of the neck, or if this is indeed a complete fistula tract, with an exit in the pharynx. The extent of the tract has significant implications as far as surgical removal. By performing a fistulogram prior to the date of the surgery, this allows one to determine the length of the tract to allows better planning of surgical time. In the case of a complete fistula tract, once the guide wire has been placed at the start of the operation, it is then possible to follow the tract easier due to the rigidity that the guide wire provides. Following the guide wire, also allows the potential use of a single incision rather than using a “step ladder” incision. This is because the rigidity of the guide wire can be palpated either by finger palpation or with a hemostat that is used to dissect the soft tissue from the surrounding fistula tract. Once the tract approaches the level of the pharynx, the Crowe-Davis mouth gag allows visualization and palpation of the hemostat in the tonsillar fossa area. In this study the tonsillectomy was performed separately allowing better visualization of the tonsillar fossa and palpation of the instrumentation from the cervical side of the operation to the pharyngeal side of the operation allowing complete removal of the fistula tract (figure 6). After the tract was removed, the constrictor musculature was approximated using 4-0 chromic suture.

Materials and Methods

After being seen in the otolaryngology clinic by the senior author, the patients were then referred to the Radiology Department for a fistulogram that was performed as an outpatient. Utilizing a sterile technique with Chloroprep, a 22 gauge angiocatheter was inserted into the fistula tract. Three milliliters of Omnipaque was injected into the angiocatheter with a 5 cc syringe under direct visualization using fluoroscopy. An AP and lateral projection was obtained in the radiology suite, and injection continued until extravasation of contrast material into the mouth resulted in staining of the tongue and pharynx (figure 1). On the day of the operation, the patient was placed supine on the operating table. A 22-gauge angiocatheter is placed into the opening of the fistula through which Omnipaque contrast is injected to opacify the tract. A 4 French KMP directional catheter is then inserted into the tract, and a 0.035 Benton guide wire of 150 cm length is inserted through the fistula tract and is followed fluoroscopically (figure 2). With a Crowe-Davis mouth gag in place, the area of exit through the pharynx is visualized, and the catheter end was grasped with a hemostat and withdrawn through the mouth (figure 3).

Conclusion

- A preoperative fistulogram can be used to determine the length of a branchial cleft fistula.
- Placement of a guide wire intraoperatively can facilitate removal of the entire tract.
- The entire tract can often be removed with a single skin incision.

References