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ORIGINAL ARTICLE

Endoscopic resection of osteoma of the forehead

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Abstract

We report the one-year follow-up of a series of endoscopic removal of osteomas of the forehead to assess the feasibility of the technique, its functional results, and the satisfaction of the patients. Osteomas were resected in five patients (two women, three men, mean age 40 years, range 30 to 55) using an endoscopic technique. All operations were successful and did not require conversion to open operation. Operating time was 20 to 40 minutes (mean 30 minutes). All patients were discharged on the day of operation. There were no postoperative complications (haematoma, nerve injury, or infection), and no recurrence at the one-year follow-up visit. All patients were satisfied with the outcome and particularly with the cosmetic result. This series confirms the surgical feasibility of removal of osteomas of the forehead and its excellent outcome in functional results and patients' satisfaction. Absence of extensive or visible scars, non-traumatic dissection, and magnification of anatomical structures are its most obvious advantages.

Key Words: Endoscopic surgery, osteoma, forehead, cosmetic

Introduction

Osteoma is a common, benign, bone-forming tumour that often develops in the craniofacial skeleton [1,2]. The classification of osteomas consists of conventional classic osteomas, periosteal osteomas, and medullary osteomas. Conventional classic osteomas are the most common type. When they develop on the forehead, the chief complaint is the aesthetic deformity.

As the possibilities of minimally invasive surgery are not widely known many patients delay requesting the operation for years: they fear a visible scar. They eventually decide to be operated on when they realise that the tumour is getting more conspicuous than the possible scar.

We report the one-year follow-up of a series of forehead osteomas removed endoscopically to assess its feasibility, functional results, and the patients' satisfaction.

Patients and methods

Patients

From May 2005 to September 2006, five patients each underwent endoscopic excision of a hard, fixed, painless mass on the forehead. Three women and two men were included after having given informed consent; their mean age was 40 years (range 30 to 55). All patients presented with a single lesion except one who presented with two. They all sought a cosmetic solution. Their main and constant complaint was the aesthetic appearance of visible lumps (Figure 1). The mean diameter of the masses was 1.5 cm (range 1 to 2.8). Three masses were located in the central third, and two on the right lower half, of the forehead. They had developed over at least two years. The appearance of the skin was normal. The patients' medical history and physical examination were otherwise unremarkable. The clinically findings suggested an osteoma. The computed tomograms



Figure 1. Preoperative picture showing an osteoma of the forehead and a diagram of the three incisions in the scalp.

taken before the operation were consistent with the diagnosis of osteoma.

Surgical technique

The operations were done under general anaesthesia. The forehead had previously been infiltrated with a saline-epinephrine solution to reduce the bleeding and to ease the dissection between the bone and the periosteal plane. Three 5 mm port incisions were made with a no. 11 blade parallel to the axis of the hair follicles and to the sagittal plane of the head. They were extended down to the bone through the galea aponeurotica and the periosteum. Three cm around the ports the dissection was achieved with an elevator without endoscopic visualisation. The sockets were then linked together in the subperiosteal space, and the osteomas visualised with the camera. The medial incision was used to insert the endoscope (Figure 2a). The lowest one (Figure 2b) served to draw off the saline solution. The incision between was used to introduce the surgical tools (Figure 2c). Under endoscopic vision (Figure 3a), high-speed bone burrs were used to remove the masses (Figure 3b). A saline solution piped through the sheath retractor continuously washed the lens and the operating field. Most of the debris was retained for pathological study. Appropriate diamond burrs were used to smooth the minute irregularities of the frontal bone. No



Figure 2. (a) The endoscope with the retractor, connected to the light source and monitor, (b) the catheter to draw the washing solution, and (c) high-speed bone burr.

electrocautery was necessary to effect haemostasis. Before closure the operative field was washed again with the saline solution. The incisions were closed with one staple each. No drain was used. A firm dressing was applied for the first 24 hours post-operatively.

Equipment

The equipment (Karl Storz GmbH & Co. KG, Tuttlingen, Germany) comprised a cool light source (175-W Xenon lamp), a fibre-optic cable, and a rigid endoscope within a sheath retractor. Excellent vision was provided by a 4-mm 30° endoscope (18 cm long) linked to a videocamera (Telecam DX1). The videocamera connected to the eyepiece of the endoscope captured the image, which was then projected on to a video monitor. Magnification was helpful to delineate minute irregularities. The specific instruments necessary to do the operation were the elevators and tweezers to pick up the biggest pieces of debris. Bipolar cautery was available but not required.

Results

The mean operating time was 30 minutes (range 20 to 40). Patients' operative courses were uncomplicated, and they were discharged the same day. They quickly resumed their daily routines with normal postoperative healing and satisfactory outcomes. The staples were removed on day 14. Microanalysis of the histological specimens showed mature cancellous and cortical bone consistent with the clinical diagnosis of osteoma. All patients assessed the outcome (and notably the cosmetic result) as very good (possible answers were bad, satisfying, good, and very good). They had no complaints about pain, infection, haematomas, numbness, or alopecia.

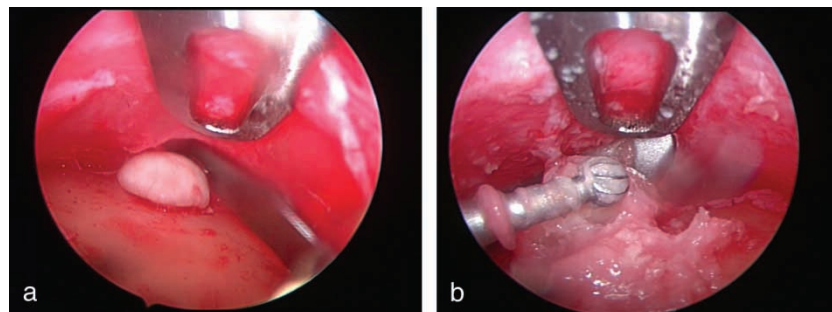


Figure 3. (a) Endoscopic view of the osteoma. (b) Resection of the osteoma with a round burr.

There was no evidence of recurrence at the one-year follow-up visit (Figure 4).

Discussion

Patients with craniomaxillofacial osteomas are usually concerned with the scar [3]. They fear both direct excision of the tumour and the coronal approach [4]. The direct approach may leave an ugly scar, usually when the forehead is smooth or the patient has a genetic predisposition to hypertrophy, keloid, and skin pigmentation. The coronal approach has many disadvantages: it is time-consuming, causes a conspicuous scar in a bald patient, blood loss, injury to the facial nerve, numbness, and itching close to the scar, as well as prolonged and obvious postoperative oedema.

Endoscopic surgery has already proved to be an effective alternative method for the resection of forehead masses such as lipomas, dermoid cysts, and pilomatrixomas [5–7]. Small and remotely-placed incisions hidden in the hair contribute to the patient's satisfaction [8]. This technique is acceptable, reliable, safe, and predictable. It reduces the length of incisions, damage to tissue, bleeding, and subsequent postoperative pain [8]. The endoscope

offers a magnified view that facilitates the elimination of minute irregularities. Other endoscopic procedures such as endoscopically-assisted brow-lift rhytidoplasty may also be done during the procedure [9]. We have done our operations under general anaesthesia, but we think that it is feasible on local anaesthesia with intravenous sedation.

Mini-invasive techniques are often difficult to learn, but this is definitely not the case with removal of an osteoma, provided that the surgeon is confident with the classic techniques. The real-time images displayed on the video monitor provide an excellent tool for teaching surgical anatomy and the technique. One session with a trained surgeon is sufficient to learn the technique. The initial steps are similar to those of the endoscopic forehead lift [10], but the dissection is easier and the risk of numbness is minimal. The subperiosteal plane is preferred for the approach to osteomas. It is easy to divide, the bleeding is minimal, as is the risk of nerve injury. Washing the operating field can reduce the potential drawback of the formation of new bone in the postoperative haematoma; this formation is either thin or over the entire forehead, so in our cases was inconspicuous.

There is also a risk of damaging soft tissues or creating a depression in the bone, but the 4-mm 30° rigid endoscope is well able to retract tissues and gives an excellent operative field. The Xenon light source is preferred because of the intense white light emitted. The main disadvantage is the cost of the equipment. However, with the expansion of endoscopic surgery, prices will probably decrease. In addition, as endoscopic tools are currently common in many surgical specialties, they can be shared in multidisciplinary operating rooms. The more critical risk is the potential for other diagnoses. We advise that the biggest pieces should be examined histologically.

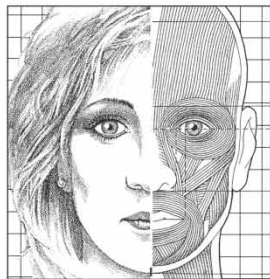
This series confirms the endoscopic feasibility of removal of osteomas of the forehead and its excellent outcome in terms of functional results and patients' satisfaction.



Figure 4. Postoperative picture at the follow-up at one year.

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