Practice Parameter

Ear Deformity: Prominent Ears

I. BACKGROUND

Protruding ears are the most frequent congenital deformity of the head and neck area affecting five percent of the general public.[1] In approximately 61 percent of the cases prominent ears can be diagnosed at birth.[2] Its etiology is unknown although approximately eight percent of patients with protruding ears have a family history of the abnormality. Ear deformities affect both genders equally. Prominent ears are usually not associated with other abnormalities or syndromes.

Prominent ears can be aesthetically displeasing, a source of psychological distress and, in some instances, dysfunctional. Most often the patient is a child whose parents seek a plastic surgery evaluation due their child's distress over ridicule by other children. While most patients are children, adults with a prominent ear deformity that has been uncorrected will often seek evaluation because of insecurities about their ears that have been a lifelong struggle.

II. ANATOMY

The most common causes of prominent ear are an underdeveloped, effaced, or absent antihelical fold; an overdeveloped or excessively deep conchal bowl; or the combination of the two.[3] A prominent mastoid process may also contribute to the protrusion. The condition may be unilateral or bilateral. There may be minor defects in the lower portion of the auricle that may also be a factor in the overall defect although these minor defects are often overlooked.

The external ear develops more rapidly compared to other components of the craniofacial anatomy. Different portions of the ear grow at different rates. By age three, ear width will reach approximately 90 percent of adult dimensions. By the end of the first year of life, about 75 percent of the ear length will occur.[4] Elastic properties of ear cartilage are normally age dependent. Before age 6 years, cartilage is malleable, and suture repositioning is maintained with a low incidence of reoccurrence. Adolescent and adult populations have a more stiffened cartilage which is less pliable.[4]

III. DIAGNOSTIC CRITERIA

A. History and Physical Examination:
Assessment of the ear includes measurement of the distance from the scalp to the helix at three points. These are: the top of the helical rim; the external auditory canal and the postero-superior origin of the lobe. These reference points can be compared with the opposite ear to help determine the degree of correction.

Protrusion can be defined by various measurements. In the normal ear, the upper third of the helix is 10-12mm from the skull, the middle third is 16-18mm from the skull, and the lobule is 20-22mm from the mastoid and should not project beyond the upper two thirds of the ear. The mid portion of the helix projects laterally beyond the rest of the ear and the earlobe does not project beyond the upper two-thirds of the ear. [4]

The auriculocephalic angle is determined by a line from the root of the helix to the most lateral edge of the helix and the mastoid plane is 25° in males and 21° in females with wide variability. Conchal depth is normally less than 15mm. The antihelical fold should be posteriorly folded and create an acute angle of less than 90° between the concha and scapha in the normal ear.[4] These measurements only serve as a reference and should not be used as absolute parameters to determine prominence. The final opinion rests with the patient, family and the surgeon and the prominence of the ear should be judged in relation to the rest of the facial structure. Preoperative evaluation may include: [4]

1. Ear protrusion and asymmetry – a difference of greater than 3mm in protrusion between the ears indicates a significant asymmetry.
2. Helix – an obtuse conchal-scaphal angle is one of the characteristics of a prominent ear deformity.
3. Conchal depth – in the prominent ear, the conchal depth is greater than 1.5cm or the concha is anteriorly rotated.
4. Earlobe – in the prominent ear, the lobule may be prominent because of the dense, interlacing connective tissue fibers that shape the earlobe.
5. Assessment of congenital auricular defects associated with prominent ears:
   a. Constricted ear deformity
   b. Stahl's ear deformity
   c. Cryptotia
   d. Macrotia
6. Assessment of the following chronic conditions that may affect surgical outcome:
   a. Otitis media
   b. Otitis externa
   c. Diminished auditory acuity
   d. Scalp infections
   e. Acne
   f. Facial asymmetry
   g. Deficient facial musculature

B. Laboratory Tests
   1. As indicated by patient's age, health, and type of anesthesia.

C. Consultation
   1. Consultation with an otoloaryngologist may be indicated if hearing loss presents at an early age.

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IV. TREATMENT

The goal of treatment is to achieve symmetry and reduce ear protrusion.

A. Non-operative Treatment:

Successful non-surgical treatment of the prominent ear deformity has been achieved by taping or splinting of the auricle. This treatment approach is limited to babies less than 6 months of age due to their pliable cartilage. Matsuo has described molding devices made with either a malleable plastic or a wire wrapped with micro-foam tape, contoured to fit the ear, conforming the deformed areas into a normal shape.[5] The time needed to correct the deformity varies from a few days to several months.

B. Operative Treatment:

1. Timing: There are differences of opinion on when the appropriate age for repair of a prominent ear deformity should take place. One philosophy advocates that the optimal time for repair of a prominent ear deformity is early in elementary school years, and before the child's self image is affected.[4,6] A recent study by Gosain et al suggests that correction of a prominent ear deformity may be performed before the age of 4 years, with satisfactory results and without impairing ear growth.[7]

2. Indications: [3]
   a. The patient or the patient's family desires a correction of the ear(s) deformity and a more symmetrical / normal appearance. It is important that the patient perceive that he/she has a deformity and is motivated to proceed with the surgery and postoperative instructions. Lack of patient cooperation and compliance with postoperative care may decrease the likelihood of a successful surgery.
   b. Prior surgery or ear deformity due to trauma.
   c. Presence of asymmetric features of the ears.

3. Surgical Options: [3, 8,9,10,11,12,13, 14]
   Surgical technique is determined by the anatomic deformity. The procedure is typically performed under general anesthesia.
   a. The incision may be placed on the postauricluar surface. Redundant skin may be excised at this point or at the end of the procedure. Preauricular incisions can be used to address hypertrophy of the concha wall.
   b. Creation of the antihelical fold:
      - Sutures are used to recreate the antihelical fold.
      - Anterior cartilage scoring may be performed at this point.
   c. Conchal reduction and setback:
      - Conchal reduction may be addressed at this point through posterior excision of cartilage.
      - Conchal-mastoid sutures such as mattress sutures may be placed between the posterior conchal wall to the mastoid periosteum and fascia.
   d. Reduction of prominence of the upper pole of the ear:
      - If needed, fossa-fascia sutures approximate the cartilage of the triangular fossa or the scaphoid fossa to the deep temporal fascia.
   e. Lobule repositioning and reduction of lobule bulk: the skin and fibro-fatty tissue may be excised from the lobule with suture reapproximation to produce setback.

4. Post-operative Care [3, 15]
   a. Dressings - The contour of the ear is reinforced with non-adherent dressing followed by gauze pads which conform to the ear. The dressing may be removed as early as post-op day one to evaluate for the presence of hematomas, pressure points, or changes in position. The ears are redressed and a headband is worn continuously for up to one month.
   b. Skin suture removal may take place at the appropriate interval.
   c. Activities such as swimming may be contraindicated for up to one month.
   d. Patients are usually followed for up to one year after surgery to assess the adequacy of the correction.

C. Possible Complications [15]

1. Immediate post-operative period
   a. Hematoma
   b. Infection
   c. Relapse of prominent ear deformity
   d. Loss or distortion of cartilage as a consequence of infection or hematoma in the immediate phase
2. Delayed
   a. Asymmetry or malposition of the ears
   b. Hypertropic scarring or keloid formation
   c. Distortion of auditory canal
   d. Relapse of prominent ears – incidence is approximately 8%

D. Provider Qualifications

The individual performing this procedure, regardless of the location of the surgical facility, should have approved hospital privileges for the procedure and be qualified for examination or be certified by the surgical board recognized by the American Board of Medical Specialties, such as The American Board of Plastic Surgery, Inc.®

V. CODING

Diagnosis	ICD-9 Code
Other specified anomalies of the ear	744.29

Procedure	CPT Code
Otoplasty, protruding ear, with or without size reduction	69300 (-50)

VI. DISCLAIMER

Clinical practice guidelines/practice parameters are strategies for patient management, developed to assist physicians in clinical decision making. This clinical practice guideline/practice parameter, based on a thorough review of the scientific literature and relevant clinical experience, describes a range of generally acceptable approaches to diagnosis, manage or prevent specific diseases or conditions. This clinical practice guideline/practice parameter attempts to define principles of practice that should generally meet the needs of most patients in most circumstances.

However, this clinical practice guideline/practice parameter should not be construed as a rule, nor should it be deemed inclusive of all proper methods of care or exclusive of other methods of care reasonably directed

at obtaining appropriate results. It is anticipated that it will be necessary to approach some patients' needs in different ways. The ultimate judgment regarding the care of a particular patient must be made by the physician in light of all the circumstances presented by the patient, the diagnostic and treatment options available, and available resources.

This clinical practice guideline/practice parameter is not intended to define or serve as the standard of medical care. Standards of medical care are determined on the basis of all the facts or circumstances involved in an individual case and are subject to change as scientific knowledge and technology advance and as practice patterns evolve. This clinical practice guideline/practice parameter reflects the state of knowledge current at the time of publication. Given the inevitable changes in the state of scientific knowledge and technology, periodic review, updating and revision will be done.

VII. REFERENCES

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