

Short Case Report

Branchio-oto-renal syndrome: a clinical case

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Abstract – Observation: A 19-week-old patient seen in an oral dermatology clinic had small labial commissures pits associated with auricular abnormalities. Similar clinical elements were found in the family medical history. A diagnosis of branchio-oto-renal syndrome (BOR) was quickly evoked. **Commentary:** BOR syndrome is a rare disease. This autosomal dominant pathology is characterized by facial lesions and renal abnormalities. Diagnosis is based on many clinical criteria. An optional genetic study can sometimes assist in diagnosis.

Observation

A 19-week-old child presented with two small bilateral labial commissural pits as her primary complaint was evaluated by a multidisciplinary team consisting of pediatric, oral, dermatology consultants (Fig. 1). The lesions were more pronounced on the left side. No seromucous flow was noted around these pits. No other lesions of the same type were found in the rest of the body. The rest of the clinical examination revealed a prominent notch in the lower part of the aural helix bilaterally (Fig. 2), with a clinical anomaly, which predominately affected the right ear. The patient's maternal uncle and half-brother had a similar unilateral lesion of the right antihelix. A renal malformation was also present in a maternal uncle and in a great maternal aunt.

The child was in good general condition and had a satisfactory height-weight development.

The overall clinical picture of the child and the presence of familial abnormalities led to the suspicion of branchio-oto-renal syndrome (BOR), and a renal ultrasound was performed. A megalo-pelvis (pyelic hypotonia) was observed, with the renal pelvis measuring 3.9 mm in the anteroposterior dimension.

Discussion

BOR syndrome is an autosomal dominant disorder most often caused by an *EYA1* mutation. It is a rare disease with an incidence of 1 case in every 40,000 in Western countries [1]. *EYA1* is the gene most frequently implicated in BOR syndrome. It is located on the long arm of chromosome 8 [2] and encodes



Fig. 1. Bilateral commissural pits without flows.

for a transcriptional regulator named Ey. Point mutations and deletions, in particular, have been identified in this gene in approximately 40% of affected patients. The first case was reported by Melnick in the late 1970s [1]. *In vivo* studies have reported renal abnormalities and hearing disorders, similar to that observed in the human phenotype, in mice with heterozygous and homozygous *EYA1* mutations [3]. *SIX1* and *SIX5* mutations can also cause BOR syndrome [1].

BOR syndrome is clinically diagnosed on the basis of numerous clinical criteria, which are subclassified into major and minor [4].

In the absence of a family history, either three major criteria alone or two major criteria combined with two minor criteria must be present for a clinical diagnosis. However, with a positive family history, only one major criterion is sufficient for a diagnosis.

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Fig. 2. Ear anomaly with marked notch on the antihelix.

The major criteria are as follows:

- a second branchial arch anomaly (lateral cervical swelling outside the sternocleidomastoid muscle, fistula at the anterior border of the sternocleidomastoid muscle);
- deafness;
- preauricular pits;
- auricular malformations;
- and renal abnormalities.

The minor criteria are as follows:

- abnormalities of the external auditory canal;
- middle ear abnormalities;
- inner ear abnormalities;
- preauricular tags (skin nodule);
- facial asymmetry;
- palatal abnormalities.

A complementary genomic molecular analysis can be performed to look for *EYA1*, *SIX5*, or *SIX1* mutations.

The present case presented with three major criteria: labial commissural pits, auricular malformation, and renal abnormality, allowing for confirmation of BOR syndrome. The existence

of familial renal and auricular abnormalities supported the diagnosis.

Differential diagnoses are branchio-oculo-facial syndrome and Goldenhar syndrome [5].

The management of this pathology is multidisciplinary. The anomalies of the second branchial arch are treated by antibiotic therapy in case of superinfections. Surgery can also be used to treat recurrent infectious episodes.

Urgent management of hearing disorder would help to avoid any problems with language learning in affected children. Treatment may be in the form of tympanoplasty or cochlear implant placement.

In addition, regular renal monitoring is warranted, and surgery may be required for treating obstructive pathologies. Renal hypoplasia and dysplasia may cause renal failure, requiring dialysis or kidney transplantation.

Conflict of interests: The authors declare that they have no conflicts of interest in relation to this article

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