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A Rare Cause of Recurring Lung Infection: Moebius Syndrome

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Abstract:- Moebius syndrome is a rare congenital disorder characterized by bilateral paralysis of the VIth and VIIth cranial nerves, leading to facial diplegia and bilateral paralysis of ocular abduction, often associated with orofacial anomalies.

This work reports a case collected at the pediatric infectious diseases and pneumo-allergology department of the Children's Hospital of Rabat, of a 9-month-old male infant, 6th of a family of six, of non-consanguineous parents, with a delay in psychomotor acquisitions. The examination shows facial dysmorphism with hypertelorism, epicanthus and right facial paralysis. Since birth, he has had swallowing disorders causing repeated respiratory infections, hence his hospitalization in our training.

The etiopathogenesis of this disease remains controversial, with a great clinical heterogeneity whose observed signs are mainly due to the involvement of the VIth and VIIth cranial pairs, mainly resulting in various orofacial and ocular anomalies. The treatment remains symptomatic based on a multidisciplinary approach.

The aim of this observation is to identify the particularities of this syndrome with a view to early diagnosis and effective management.

Keywords:- *Moebius Syndrome, Congenital Strabismus, Congenital Facial Paralysis.*

I. INTRODUCTION

Moebius syndrome (MS) is defined as a congenital facial weakness associated with abnormal ocular abduction. It is characterized by bilateral congenital paralysis of the 6th and 7th cranial pairs, revealed by facial diplegia and bilateral abduction paralysis, often asymmetrical and incomplete, sparing the lower face and the platysma muscle of the neck, giving the face a mask-like appearance with an absence of mimicry [1]. There is a high incidence of associated congenital malformations. The most common malformation is clubfoot [2]. Brachial malformations and pectoral muscle hypoplasia have also been described.

Moebius syndrome was first reported by Von Graefe in 1880 [3] as congenital easy diplegia, and then by Paul Julius Möbius, a German neurologist, in 1888 [4] and 1892 [5] who described its clinical features.

Very rare disease with limited epidemiological data. Its prevalence is estimated at 0.0002% - 0.002% of live births [6,7]. Furthermore, no differences in incidence were found between different sexes or races [7,8].

II. OBJECTIVES AND METHODS

This work reports a case collected in the pediatric infectious diseases and pneumo-allergology department of the Children's Hospital of Rabat. The aim is to identify the particularities of this syndrome with a view to early diagnosis and effective management.

III. OBSERVATION

This is a 9-month-old male infant, 6th of a family of six, of non-consanguineous parents. The pregnancy was monitored and carried to term without incident with a birth weight of 2000g. The clinical symptoms began at birth with swallowing disorders causing repeated respiratory infections, hence his hospitalization in our training. On admission, the infant was tonic pink, afebrile with a temperature of 37.4°C, a weight of 7600g (-1DS), a height of 69cm (-1DS) and a head circumference of 45cm (Normal for age), presenting facial dysmorphism with hypertelorism, epicanthus and right facial paralysis (Cf fig 1). The infant presents a delay in psychomotor acquisitions (sitting position with support at the age of 9 months, standing position impossible, language is limited to babbling). In terms of breathing, the examination finds a chest of normal morphology, the respiratory rate is 35 cycles/min, saturation at 96% in room air, a subcostal indrawing and bilateral snoring rales. The chest X-ray (see fig. 2) shows poorly defined bilateral pulmonary foci probably related to inhalation pneumonia. The chest CT scan (see fig. 3) highlights alveolar condensations of the ventral segment of the right upper lobe and the left internal basal lobe, initially suggesting an infectious origin. The ophthalmological examination revealed pseudo-strabismus due to the epicanthus associated with exposure keratitis. In addition,

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the mother reported that her baby did not react to noise and associated deafness was observed.

In order to look for other malformations, transthoracic and abdominal ultrasound were unremarkable. The brain scan was normal.

Given the picture of repeated pulmonary infections, the diagnosis of immune deficiency was raised but rejected in the face of HIV serology which came back negative, then a weight-based dosage of immunoglobulins and lymphocyte subtyping which came back normal. The diagnosis of inhalation pneumonia was retained, caused by swallowing disorders in the context of MS.

IV. DISCUSSION

SM is a non-progressive congenital disease, with a normal life expectancy in most patients, characterized by great clinical heterogeneity and, often, by asymmetric involvement.

The clinical signs observed in this syndrome are due to the involvement of several cranial nerves, particularly the VIth and VIIth cranial nerves, which control the functions of the eye and face, respectively [9]. This is mainly reflected by various orofacial anomalies, as well as ocular malformations [10]. Delayed psychomotor development, musculoskeletal malformations, neurological disorders, problems related to the endocrine and respiratory systems can be observed [9,11].

Among the orofacial malformations, the most common is facial paralysis due to damage to the VIIth cranial nerve, usually bilateral and incomplete. It causes impairment of facial sensation, speech, feeding and expression. Patients have an amimic facies that deprives them of the ability to convey emotions, which causes difficulties in establishing social and emotional relationships [12]. In addition, cleft lip and palate, macrognathia and microstomia, epicanthal folds, hypertelorism, bifid uvula, aglossia/microglossia and dental problems have also been observed [13,14].

Ophthalmologic involvement is also quite common, with alterations of ocular motility and unilateral or bilateral disorders of eye movements in abduction of which esotropia is the most frequent, ectropion, epiphora, exposure keratitis (as in the case presented), ophthalmoplegia and ptosis [15].

Paralysis of other cranial nerves (V, IX, XI, and XII), can lead to swallowing and breathing problems due to palatopharyngeal dysfunction, inadequate cough reflex, glottic spasm, and laryngeal paralysis [10]. The reported case had recurrent respiratory infections secondary to this incoordination in swallowing.

Musculoskeletal abnormalities range from hypoplasia to aplasia of the fingers of the upper and lower limbs, to brachydactyly, syndactyly, ectrodactyly and several other orthopedic pathologies such as talipesequinovarus, ankylosis and scoliosis [10,15].

Skin abnormalities have been associated with Moebius syndrome, including café-au-lait pigmentation, axillary webbing, and absence of subcutaneous tissue.

Although the intelligence of these patients is generally comparable to that of the normal population, some studies show an association, to some extent, with behavioral alteration, autism and intellectual disability [8].

Etiopathogenesis Moebius syndrome remains controversial, but it appears to be multifactorial. Two causes have been proposed in the literature: a genetic cause and a vascular cause. Intrauterine environmental exposures have also been implicated [16] such as intrauterine infections, hyperthermia, intrauterine trauma, and prenatal exposure to teratogens (alcohol, misoprostol, thalidomide, ergotamine, and benzodiazepines).

Disruption of the vascular supply to the subclavian artery territory during the sixth week of embryological development may result in abnormal brainstem development [17]. This vascular disruption of the subclavian artery may be due to fetal vascular events such as thrombus formation, embolism, and hemorrhage, or to vasoconstriction resulting from maternal use of abortifacients such as misoprostol and maternal cocaine abuse [18,19].

Due to the distribution pattern of the embryonic basilar artery (branch of the vertebral artery), the dorsomedial aspect of the brainstem is the region most susceptible to hypoxic ischemia [20].

Genetically, two genetic loci have been reported in association with Moebius syndrome, at 3q21-q22 and at 10q. In addition, de novo mutations involving REV3L and PLXND1 genes have also been observed in association with congenital facial paralysis in Moebius syndrome [12,22]. Furthermore, mutations in HOXA1, HOXB1 and TUBB3 genes have been observed in atypical forms of Moebius syndrome [23,24].

Prenatal genetic diagnosis is possible if pathogenic mutations responsible for the disease have been identified in the family (very rare cases).

Brain imaging is not indicated for diagnosis, but many experts recommend it especially to rule out other similar conditions.

Computed tomography (CT) and magnetic resonance imaging (MRI) can reveal bilateral calcifications in the regions of the nuclei of the sixth cranial nerve [25] and highlight brain malformations.

It has also been noted that on imaging, the brainstem may appear hypoplastic, with straightening of the floor of the fourth ventricle [26]. Absence or hypoplasia of the VIth and VIIth cranial nerves are the most common radiological abnormalities in sporadic MS, and hypoplasia of the IXth cranial nerve may be an associated feature [26].

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Abnormal electromyography may help to relate a patient's symptoms to congenital trauma (especially when forceps are used for breech deliveries) and not to distinguish Moebius syndrome where the EMG is normal.

Prenatal ultrasound is not indicated. It has been used to describe basal ganglia and brainstem calcifications in the developing infant brain [27].

The management of SM is mainly symptomatic. It must be multidisciplinary, requiring coordination between teams. Consultation in pediatric plastic surgery has an important place.

Feeding is made easier by a specially adapted Haberman-type bottle nipple.

Ophthalmic abnormalities such as strabismus and lagophthalmos can be corrected surgically.

Regular monitoring by an ENT specialist is necessary to identify and treat hearing problems that could interfere with language acquisition.

Improving motor and sensory skills through early rehabilitation and parental support can further improve children's long-term physical and psychological prognosis [28].

Physical therapy, occupational therapy and speech therapy are essential to rehabilitation.

Possible limb abnormalities, such as clubfoot, will require orthopedic treatment.

Regarding facial paralysis, several approaches can be considered, including the possibility of creating a smile, "Smile Surgery", by muscle transfer in children from school age.

V. CONCLUSION

SM is a rare congenital disease whose diagnosis is based exclusively on clinical signs. Raising awareness among physicians to consider this diagnosis in the face of facial dysmorphism, amimia, and swallowing disorders remains important in order to avoid diagnostic errors and early management. Treatment remains symptomatic and based on a multidisciplinary approach. Genetic counseling for a possible prenatal diagnosis of this pathology is still in its infancy.

Fig 1: Facial Appearance with Hypertelorism and Epicanthus.

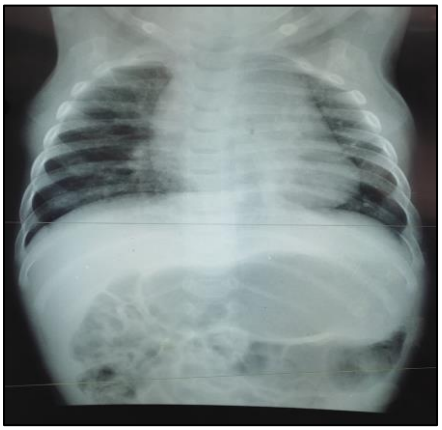

Fig 2: Frontal Chest X-Ray Showing Poorly Defined Bilateral Pulmonary Foci Probably Related to Aspiration Pneumonia.

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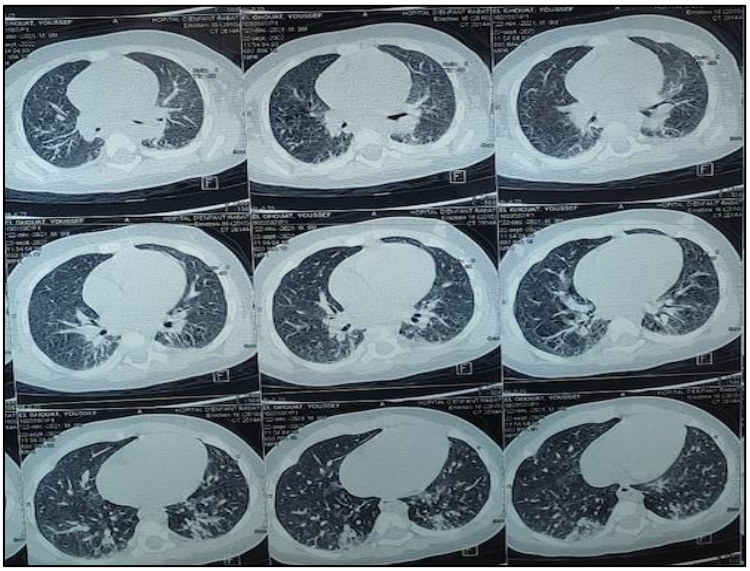

Fig 3: Thoracic CT Scan in Transverse Sections Showing Alveolar Condensations of the Ventral Segment of the Right Upper Lobe and Left Internal Basal Lobe, Initially Suggesting an Infectious Origin.

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