APERT SYNDROME

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Abstract: *Apert syndrome is a genetic disorder characterized by the premature fusion of certain skull bones (craniosynostosis). This early fusion prevents the skull from growing normally and affects the shape of the head and face. In addition, a varied number of fingers and toes are fused together (syndactyly). Most cases are sporadic, but autosomal dominant inheritance has been reported.*

Keywords: *syndactyly, craniosynostosis, congenital malformation, gene*

Rezumat: *Sindromul Apert este o afecţiune genetică caracterizată printr-o fuziune prematură a oaselor capului(craniosinostoză). Fuziunea prematură a oaselor capului afecteaza dezvoltarea normală a formei capului şi a feţei. In plus un numar variabil de degete de la mană si picior sunt unite între ele(sindactilie). Cele mai multe cazuri sunt sporadice, dar modul de transmitere a bolii este de tip autosomal dominant.*

Cuvinte cheie: *sindactilie, craniosinostoză, malformaţie congenitală, genă*

INTRODUCTION

Apert syndrome, known as acrocefalosyndactilly type 1, belongs to a group of disorders known as congenital craniofacial malformations. Syndrome is named after the French paediatrician Eugène Apert, who in 1906 described nine people with congenital malformations of the skull, face, hands and feet.

Incidence:

Approximately one per 100,000 children is born with Apert syndrome. Syndrome was diagnosed around the world and is distributed equally between girls and boys.

Etiology of the disease:

In 1995, the mutation was discovered a gene located on chromosome 10 (10q25q26). Affected gene is called FGFR2 (Fibroblast Growth Factor Receptor 2) FGFR2 mutation represents an upside of 3 amino acids located adjacent to the gene exon 7.

In most cases, the cause of the syndrome is a mutation nine (de novo) in that it is not inherited from parents. There is virtually no risk that a child affected parents have another child syndrome aperta. However, the new mutation is hereditary and there is a risk that the new mutation to move forward descendants. Model of inheritance is autosomal dominant then. Autosomal dominant transmission implies that if one of the parents present and the disease gene mutation default response to occur, the risk to move forward to issue is 50%. Children who do not inherit the mutation have no risk of transmitting the disease to their descendants.

Physiopathology

Mutations in FGFR2 lead to increasing the number of precursors involved in osteogenesis=> dot-matrix increased bone subperiostal => premature ossification => abnormal skull development: increasing head length and width, mediofacial hypoplasia, jaw hypoplasia, eyeball protrusion, the upper air ways obstruction. Mutations of FGFR2 and is involved in producing syndromes Crouzon, Pfeiffer and Kallman syndrome.

Signs and symptoms:

- On the skull: acrocephalism, brachycephalism, turibrachycephalism, flattened occipital, forehead, fontanele broad ditches above the horizontal crest supraorbitae
- On the face: the flattened, trapezoidal-looking mouth, maxillary hypoplasia, midface hypoplasia.
- In the ears: ears pasted down, malformations of the flag, malformations of the external auditory pipeline, deafness
- Eye: hipertelorism, fanta palpebrata tilted down, exoftalmy, strabismus, ambliopy
- On the nose: the aspect of parrot beak, fronto-nazal moat deep.
- In the mouth: prominent mandible, bolta ogive , palatoschizis, macroglosy, supernumerary teeth, vicious implanted, malocclusion
- Extreme and Fingers:
  - Syndactilly at hands and feet: part of "hands in gloves"; part of "standing in socks"
  - Concavity accentuated web
  - Supination planting
- Skin:
  - Acneiforme lesion (front, back, thorax, arms)
  - Continuity interruption brows
  - Hypopigmentation
  - Fragile nails
  - Night sweats

- Vertebral column: cifoscoliosys
- CNS:
  - Agenesis of the corpus callosum
  - Malformation of languages:
  - Ventriculomegaly
  - Encephalocel
  - Hypoplasia of the white substance
  - Pyramid tract abnormalities
- The cardio-vascular and genitourinary systems:
  - ASD, VSD
  - Persistent arterial channel
  - Pulmonary stenosis
  - Dextrocardia
  - Fallot tetralogy
  - Polycystic kidney
  - Hydronephrosis
  - Atresia of the vagina
  - Clitoromegaly
  - Cryptorchidism
- The digestive and respiratory systems:
  - Pyloric stenosis
  - Esophageal atresia
  - Traheo-esophageal fistula
  - Ectopic anus, anal imperforation
  - Abnormal tracheal cartilage
  - The absence of right lung middle lobe

Differential diagnosis:

- Cruzon syndrome
- Bear-Stevenson syndrome
- Carpenter syndrome
- Pfeiffer syndrome

Paraclinic examinations:

- Skull radiography: lack of suture line; turibrachycephalism; maxillary hypoplasia.
- Spinal column radiography:
  - union-C5-C6 vertebrae
  - vertebral-body small
  - nick intervertebral spaces
- Hand radiography:
  - full-syndactilly (fingers 2,3,4)
  - short pollux-, radially deviated
  - the proximal phalanx of the pollux is in the shape of "delta"
- Foot radiography: full-syndactilly (fingers 2,3,4);the proximal phalanx of the hallux is in the shape of "delta"
- Arms radiography: short humerus
- CT - 3D
- MRI
  - changes of the soft structures
  - abnormal brain

Prenatal diagnosis:

- Echography:
  - Acrocefaly
  - bose-front
  - appearance of “hand in glove”
  - radial deviation of pollux
- Amniocentesis+ testing fetal DNA

Prognosis: Depends: Age at which is doing surgical intervention**,** CNS associated malformations **,** Quality of family environment

Complications: HIC, Hydrocephaly, Obstruction of the aerial ways, Respiratory failure, Apnee in sleep

Treatment:

- Medical
  - Treatment of ear infections environments
  - Use of hearing devices
  - Use glasses
  - Management AS
  - Psychological Counseling
  - Genetic counseling
- Surgery
- Craniectomy (at 6 months)
- Corrections middle portion of the face, jaw and the mandible (in adolescence)
- Treatment of palatine cleft (up to 12 months)
- Separation of finger surgery
- Orthodontic treatment (at 11-12 years)
- Amigdalectomy, tracheotomy
- Shunts develop

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