Syndrome of the month

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Coffin–Siris syndrome

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In 1970 Coffin and Siris described three unrelated female children with severe mental and developmental retardation, sparse scalp hair, and coarse appearing facies with bushy eyebrows, a wide mouth, and thick lips. There were, in addition, lax joints and brachydactyly of the fifth digits of both hands and feet with absence of the nails and terminal phalanges.1

To our knowledge, there have been 31 cases of this condition reported and these are reviewed in the present paper with the addition of two new cases.

Frequency of features.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Total cases</th>
<th>Our cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex F:M</td>
<td>25:6</td>
<td>1:1</td>
</tr>
<tr>
<td>Low birth weight</td>
<td>15/30</td>
<td>+ +</td>
</tr>
<tr>
<td>Growth deficiency</td>
<td>17/21</td>
<td>+ +</td>
</tr>
<tr>
<td>Postnatal</td>
<td>14/17</td>
<td>- -</td>
</tr>
<tr>
<td>Developmental delay</td>
<td>29/29</td>
<td>+ +</td>
</tr>
<tr>
<td>Mental retardation</td>
<td>19/19</td>
<td>+ +</td>
</tr>
<tr>
<td>Retarded bone age</td>
<td>10/14</td>
<td>? +</td>
</tr>
<tr>
<td>Microcephaly</td>
<td>20/29</td>
<td>- +</td>
</tr>
<tr>
<td>Sparse scalp hair</td>
<td>21/26</td>
<td>+ +</td>
</tr>
<tr>
<td>Coarse face</td>
<td>25/29</td>
<td>+ +</td>
</tr>
<tr>
<td>Bushy eyebrows</td>
<td>22/29</td>
<td>- +</td>
</tr>
<tr>
<td>Broad nose/nasal tip</td>
<td>22/27</td>
<td>+ +</td>
</tr>
<tr>
<td>Wide mouth</td>
<td>21/25</td>
<td>+ +</td>
</tr>
<tr>
<td>Thick/prominent lips</td>
<td>26/30</td>
<td>+ +</td>
</tr>
<tr>
<td>Hypoplastic/absent nails on 5th digits</td>
<td>31/31</td>
<td>+ +</td>
</tr>
<tr>
<td>Generalised hirsutism</td>
<td>23/28</td>
<td>+ +</td>
</tr>
<tr>
<td>Feeding problems</td>
<td>24/28</td>
<td>+ -</td>
</tr>
<tr>
<td>Recurrent respiratory infections</td>
<td>13/21</td>
<td>- +</td>
</tr>
<tr>
<td>CNS defects</td>
<td>5</td>
<td>- + DW</td>
</tr>
<tr>
<td>Cardiac defects</td>
<td>9/20</td>
<td>- -</td>
</tr>
<tr>
<td>Renal defects</td>
<td>3/10</td>
<td>- -</td>
</tr>
<tr>
<td>Scoliosis</td>
<td>6/15</td>
<td>- -</td>
</tr>
</tbody>
</table>

DW = Dandy–Walker malformation.

Clinical features (table, figs 1 to 4)
The main features are growth and developmental retardation, sparse scalp hair, bushy eyebrows, wide mouth with prominent or thick lips especially the lower lip, and body hirsutism. Absent or hypoplastic nails of the fifth fingers and toes with absent or hypoplastic phalanges are also present.

GRANIOFACIAL
Microcephaly is present in 20/29 of the cases. The face is described as coarse with hypertrichosis, although there is sparse scalp hair. There are bushy eyebrows (22/29), a flat nasal bridge (19/23), a broad nasal tip (22/27), and a wide mouth (21/25) with prominent or thick lips (26/30).

Figure 1 Case 1, face. Note facial hirsutism and sparse scalp hair.
Coffin–Siris syndrome

Case 1 described by Carey and Hall² and that of Ueda et al.³ did not have bushy eyebrows, only long eyelashes. Furthermore they did not have coarse features and the case of Ueda et al.³ did not have sparse scalp hair or body hirsutism. It might be that the coarse facies need not be present in early infancy, and it is documented that the sparse hair can disappear with age, but as the two cases mentioned above also had cardiac lesions, they might represent different entities.

LIMBS
Absent or hypoplastic nails of the fifth digits are a constant feature (100%), and other digits are affected to a lesser degree (22/25). There are only three cases in which the thumb or big toe or both are involved.² 4 5

GROWTH AND MENTAL DEVELOPMENT
Some mothers (5/18) have noted a decrease in fetal activity during intrauterine life, and a low birth weight was reported in 15/30 cases.

In early infancy, feeding difficulties (24/28) and frequent respiratory infections (13/21) are common. The presence of growth retardation occurred in 17/21 cases and is essentially postnatal (14/17).

Developmental delay occurred in all cases and mental retardation in 19/19, where this was mentioned, although to a variable degree. The mental retardation was described as severe in 10/19 cases, but in the additional 12 cases there was no mention of mental retardation. Most of these patients were still very young and three had already died.

SKELETAL RADIOGRAPHS
Absence or hypoplasia of the distal and middle phalanges, especially those of the fifth digits of the hands and feet, is always present. Retarded bone maturation is common (10/14). There are occasional abnormalities such as radial head dislocation (4 cases), narrow intervertebral disc spaces (3), scoliosis (6), hypoplastic clavicles (2), mild coxa valga (6), hip dislocation (3), cone shaped epiphyses and pectus excavatum (2). Absent or hypoplastic patellae were present in eight cases.
OTHER FEATURES
Hypotonia or lax joints or both were present in 23/24 cases. Body hirsutism was present in 23/28 cases especially on the forehead and back.

OCCASIONAL ABNORMALITIES
There have also been several other features described: epicantus (5 cases), palpebral ptosis (3), preauricular appendages (1), cutis marmorata (3), and a single palmar crease (4).

In two cases there were one and two small cutaneous haemangiomas. Umbilical or inguinal hernia was described in three, and of the six males ascertained from published reports, three had bilateral cryptorchidism, one had unilateral cryptorchidism, and one had hypospadias.

The ocular findings were hypoporia, hypermetropia, astigmatism, strabismus, nystagmus, buphthalmos, and cataract. These were reported in only five children. Regard the CNS anomalies, necropsy was performed on four cases. In the original Coffin–Siris report, case 1 had a Dandy–Walker malformation. In the report of Tunnessen et al a Dandy–Walker malformation was present, with agenesis of the corpus callosum and the anterior commissure. In the case described by DeBassio et al there was hypoplasia of the corpus callosum, abnormal olives, abnormal arcuate nuclei, and ectopic cerebellar nuclei, and in the report of MacDonald et al an atrophic cerebrum was present. Mastroiacovo et al reported the only live child in whom CNS anomalies were detected, who had a large cisterna magna.

There were 10 cases (out of the total of 20) in which the patients had cardiac defects. Out of these we were able to review photographs of nine. The lesions were: a patent foramen ovale (1), tetralogy of Fallot (1), atrial septal defect (4), patent ductus arteriosus (3), ventricular septal defect (2), pulmonary stenosis (1), and persistent left superior vena cava (1). Two of these cases are case 1 of Carey et al and the one by Ueda et al, but these patients do not have the usual facial features of the syndrome. It should be concluded that cardiac anomalies are unusual in Coffin–Siris syndrome and the other features have to be characteristic before making a positive diagnosis. There were four cases described with renal anomalies including hydronephrosis in two cases, one case of congenital microureters with stenosis of the vesicoureteral junction, and one of an ectopic kidney.

In the gastrointestinal system there have been two cases of perforated ulcer, one gastric and one duodenal, one case of intestinal malrotation, one of intussusception, and one of necrotising enterocolitis and pyloric stenosis. The 17 karyotypes mentioned were normal.

Inheritance
The suggestion that Coffin–Siris syndrome is inherited as an autosomal recessive trait is based on four reported sibships. The cases described by Mattei et al are not totally convincing. They were the offspring of seemingly unrelated parents from North Africa but the authors note that “consanguinity is difficult, sometimes impossible, to rule out reliably”. The sibs reported by Carey and Hall are difficult to evaluate in that only one survived (that case looks genuine whereas the other had a coarse facial appearance “similar to that seen in Hurler’s syndrome” and it must remain uncertain whether that child had the same condition (the fifth fingers were short with absence of the nails)). The third reported sibship, that of Haspeslagh et al is also difficult to be sure about, and the interpretation is made more difficult by the fact that the father of the sibs was said to be ‘analphabetic’ and had thick, bushy, conjointing eyebrows and bilateral hypoplasia of the fifth toes with hypoplastic nails. The mother was of borderline intelligence in this non-consanguineous mating. The final sibship is that reported by Franceschini et al, but pictures of the second sib are not convincing (nor is the single case of Gellis and Feingold). The single patient reported by Uzielli et al was the product of first cousin parents. It should also be noted that the patient reported in the Baraitser and Winter Colour atlas of clinical genetics (1983) as having Coffin–Siris syndrome has now been shown to have trisomy 9p, and it remains possible that some of the published single cases and even sibships will prove to be chromosomal rather than mendelian in nature. At present it is the authors’ practice to counsel a 10% recurrence risk for a further affected child if the phenotype is correct and further evidence is needed to confirm whether the condition follows autosomal recessive inheritance.

Addendum
Recently, a convincing single case was reported by Qazi et al.
Coffin-Siris syndrome.

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