Aglossia-adactyia syndrome

N. C. NEVIN,* D. BURROWS,† GRACE ALLEN,‡ D. C. KERNOHAN**

Summary. Aglossia-adactylia is described in two male patients, aged 31 and 21 years old. Including a previous reported case (Nevin, Dodge, and Kernohan, 1970) there are three patients with this syndrome in Northern Ireland. The aetiology is unknown but in spite of the extreme variability of the clinical manifestation, a dominant mutant gene cannot be ruled out.

Congenital absence of the tongue (aglossia), first described in the eighteenth century by de Jussieu (1718/1719), is an unusual and rare condition. Kettner (1907) was the first to report the association of aglossia and severe anomalies of the hands and feet; however, his patient also had glossopataline ankylosis. The first true case of aglossia-adactylia was described by Rosenthal (1932), in a three-year-old girl with micrognathia, a cleft of the lower lip, absence of the lower incisors, and a tongue which consisted only of a small median rudiment. She also had anomalies of both hands and of the right foot. Gorlin and Pindborg (1964) and Spivack and Bennett (1968) reviewed the published cases of aglossia-adactylia. Since then several new cases, making a total of 16 (Table I), have been described (Kelln, Bennett, and Klingberg, 1968; Temtamy and McKusick, 1969; Hoggins, 1969/1970; Harwin and Lorinsky, 1970; Nevin et al, 1970; Bernard et al, 1971; Cohen, Pantke, and Siris, 1971; Grislain et al, 1971; Hall, 1971). This paper describes aglossia-adactylia in two adults.

Case reports

Case 1. The patient, a 31-year-old male, born 5 January 1942, was admitted to hospital with a left epistaxis. Examination showed an abnormally shaped tongue, severe congenital anomalies of the hands and lower limbs, and mild hypertension.

He is the third born of normal unrelated parents. The father was aged 28 years, and the mother 25 years at the birth of the patient. The mother's pregnancy and the birth and postnatal history of the patient was unremarkable. He has three sibs, two brothers and a sister, all of whom are normal. There is no family history of congenital abnormalities.

He was an intelligent man with severe anomalies of hand and lower limbs. The tongue was small, about one-third the normal size with an irregular edge, giving it a lobulated appearance with a poorly defined tip. A short lingual frenum with which it was connected to the floor of the mouth, was situated about 1 cm behind the lower incisors and prevented a normal protrusive movement of the tongue (Fig. 1).

Fig. 1. Case 1, showing small tongue with a poorly defined tip.
Nein, Burrows, Allen, and Kernohan

TABLE I
AGLOSSIA-ADACTYLIA SYNDROME

<table>
<thead>
<tr>
<th>Reference</th>
<th>Aglossia or Hypoglossia</th>
<th>Micrognathia</th>
<th>Cleft Palate</th>
<th>Anomalies of Limbs</th>
<th>Other Anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rosenthal (1932)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td></td>
<td>Median notch lower lip; abnormal teeth</td>
</tr>
<tr>
<td>Sinclair and McKay (1945)</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>Incomplete median upper hare lip</td>
</tr>
<tr>
<td>Pulford et al (1956)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td></td>
<td>Abnormal teeth</td>
</tr>
<tr>
<td>Shear (1956)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Bony fusion of jaws</td>
</tr>
<tr>
<td>Dekaban (1959)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Abnormal teeth; labial adhesions</td>
</tr>
<tr>
<td>Pettersson (1961)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>Cartilaginous fusion of jaw</td>
</tr>
<tr>
<td>Kelln et al (1964)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>Bony fusion of jaws</td>
</tr>
<tr>
<td>Temtamy and McKusick (1969)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Agenesis lower lip</td>
</tr>
<tr>
<td>Nevin et al (1970)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td></td>
<td>Bony fusion of jawslabial adhesions</td>
</tr>
<tr>
<td>Harwin and Lorinsky (1970)</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>Cartilaginous fusion of jaw</td>
</tr>
<tr>
<td>Bernard et al (1971)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>Median cleft lower lip; pectus</td>
</tr>
<tr>
<td>Cohen et al (1971)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>excavatum; mental retardation</td>
</tr>
<tr>
<td>Grisslain et al (1971)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>Chest deformity</td>
</tr>
</tbody>
</table>

There were severe hand anomalies (Fig. 2); the thumb and fifth fingers were hypoplastic and the second, third, and fourth fingers especially on the left, were rudimentary. Radiographs (Fig. 3) showed absence of middle and distal phalanges of the second and third fingers and of the distal phalanx of the fourth finger. The middle phalanx of the fifth finger was markedly hypoplastic. The metacarpal and carpal bones were normal.

In the lower limbs the anomalies were below the knee —right hemimelia and syndactyly of the left second to fifth toes. Radiographs of the left foot showed fusion of the phalanges of the great toe and absence of middle phalanges of the second to fifth toes. The toe and fingernails were thickened and pitted (Fig. 2); a change observed only in the last six months.

Dermatoglyphics were abnormal. The dermal ridges

**FIG. 2.** Case 1. The dorsal aspects of the hands with severe digital anomalies.

**FIG. 3.** Case 1. Radiographs of the hands.
on the fourth fingers were 'off the edge' and arches and loops were present on the other fingers. The palmar abcd triradii were absent and the axial triradii (t) were distally placed. A vestige pattern was present in T/I, areas and carpal and ulnar loops in the left and right hypothenar areas, respectively.

Other clinical features were related to the cardiovascular system; an ejection systolic murmur in left parasternal area, blood pressure 18.6/13.3 kPa (140/100 mm Hg) and a grade IV retinopathy of fundi.

**Investigations.** These showed: haemoglobin 14.6 g/dl; total white cell count 8.0 x 10⁹/l with a normal differential count; blood urea 5.5 mmol/l (33 mg/100 ml), total plasma proteins 78 g/l with normal electrophoresis, serum calcium and phosphorus were 2.5 and 0.7 mmol/l (10.4 and 2.6 mg/100 ml), respectively and urinary and plasma catecholamines 0.56 μmol/24h (103 μg/24 h) and 0.7 μg/l, respectively. All these findings were unremarkable. Karyotype was of a normal male (46,XY). Fungus examination of nail clippings was negative. The ECG revealed ischaemic heart disease with T-wave flattening and inversion in leads II, III, aVF, and leads V3 to V6. An intravenous pyelogram and radiographs of the chest, skull, and mandible were normal.

**Case 2.** The patient, a 21-year-old male, born 22 February 1952, complained of loss of scalp hair. Examination also revealed an abnormally shaped tongue, and congenital anomalies of the hands and feet. He was the first born of a sibship of two. The parents were unrelated; the father was 36 years and the mother 30 years at the birth of the patient. Parents and a sister were normal. There were no orofacial or skeletal defects in the relatives. The patient had had a congenital bilateral paralysis of the external rectus muscle which had been corrected surgically.

The tongue was small and abnormally shaped with no defined tip, an irregular edge and no definitive junction with the floor of the mouth (Fig. 4). He was unable to protrude or touch his lips. Due to the absence of the tongue in the anterior part of the mouth the lower incisors were retroinclined.

There were severe hand anomalies (Fig. 5); the thumb and fifth fingers were hypoplastic and the second, third, and fourth fingers, especially on the left, were rudimentary. On the radiographs (Fig. 6) the left second and third metacarpals were slightly smaller than normal. There were no phalanges of the index and middle fingers. A tapering proximal phalanx was present for the thumb, fourth and fifth digits but only in the latter was there a second phalanx, although this was small and abnormal. On the right, the metacarpals were of normal length, but the second metacarpal was slightly tapered distally. There were two short phalanges in the thumb; only one phalanx was present in the third and fourth fingers. There was no middle phalanx of the fourth and

**FIG. 4.** Case 2, showing small abnormally shaped tongue with no defined tip.

**FIG. 5.** Case 2. The palmar aspects of the hands with severe digital anomalies.
only the trapezoid and VDRL, and simian rudimentary formed the feet triradii axial varus deformity of the sia indicates total absence the rarelimb anomalies. Intrauterine environmental factors may be important (Gorlin and Pindborg, 1964). Torpin (1968) suggested that membranous strands produced by the rupture of the amniion in early pregnancy constrict or amputate limbs and may also produce oral anomalies due to the ingestion of amniotic strands which interfere with oral development. In one report the patient’s mother had had oral and intramuscular Tigan and oral Benedic-
these drugs failed to demonstrate an increase in the incidence of deformities (Hall, 1971).

A genetic basis for this syndrome is possible. A chromosomal basis is unlikely. Normal karyotypes have been recorded in at least six recent cases (Temtamy and McKusick, 1969; Nevin et al, 1970; Bernard et al, 1971; Grislain et al, 1971; Hall, 1971). Both the present cases had normal male chromosome constitutions. Autosomal recessive inheritance also appears unlikely as affected sibs and consanguinity has not been recorded in any family. Some authors have proposed autosomal dominant inheritance. Temtamy and McKusick (1969), found that in the families of seven patients with aglossia-adactyly or glossopalatine ankylosis, some relatives had orofacial anomalies. In no instance were limb anomalies observed in a relative. These authors suggested that aglossia-adactyly were due to an autosomal dominant gene with extreme variability and reduced penetrance. As most cases are sporadic the condition may be due to a dominant mutant gene. The extreme variability of the syndrome indicates that aglossia-adactyly may be only one of an aetiological heterogeneous group.

The occurrence of three patients with aglossia-adactyly in the small community of Northern Ireland (population 1 550 000) indicates that this disorder is commoner than formerly realized. We suggest that the tongue should be closely examined in patients with limb anomalies. If aglossia or hypoglossia is present, than a detailed family history and examination of relatives should be undertaken and a thorough search made for possible genetic and/or intrauterine factors.

References


Kettner, Dr. (1907). Kongenitale Zungendefekt. Deutsche Medizinische Wochenschriften, 33, 932.


