

From the skin culture, 60 cells were counted. Only 4 cells contained 46 chromosomes, one 45, and the remainder 47. Confirmation of trisomy 13 was again obtained after trypsin banding, but the 4 cells with 46 chromosomes were banded unsatisfactorily for complete analysis. Of these, 2 contained 7 D chromosomes and 2 only 6.

Discussion

Trisomy 13 has been well recognised since the first modern description by Patau *et al.* (1960). This boy shows many of the clinical features of the syndrome and several are associated with a poor prognosis.

In the review by Magenis *et al.* (1968), it was noted that those with chromosomal mosaicism, or with a Robertsonian translocation, tended to survive longer than those with primary trisomy. However, Hodes *et al.* (1978) did not find any difference in survival rates between their cases of translocation and primary trisomics. Among the cases in published reports with survival beyond 5 years, Smith (1964, 1976) mentioned a child of 5 years and an adult of 33 years, but did not give any indication of the cytogenetic findings. Magenis *et al.* (1968) reported a girl aged 10 with trisomy D, but gave no details of cytogenetic studies. Mankinen and Sears (1976) and Hodes *et al.* (1978) each reported a girl aged 5.25 years and 5.5 years, respectively, with evidence of trisomy 13. Only blood specimens were investigated, but no mosaicism was detected.

Two types of tissue, blood and skin, have been studied in our patient. The results from both confirm trisomy 13 and provide strong evidence for excluding mosaicism. In the total of 164 cells counted, only 8 contained a complement of 46 chromosomes, and 6 of these were found to include 7 D chromosomes. Hence, it is most probable that these 8 cells represent those originally with $2n = 47, XY+D$, but with subsequent random chromosome loss. Our patient is unusual, therefore, in surviving as long as he has, since he is now 9 years of age. There may be several factors to account for this. It has been stated that surgery should not be considered in early infancy in children with Patau's syndrome (Smith, 1976) and doubtless this accounts for some of the mortality in the neonatal period and shortly thereafter. The child reported here had his omphalocele repaired surgically soon after birth. His other anomalies are not directly life threatening. Furthermore, the devoted care and attention he receives from his parents are contributing considerably to his relative longevity.

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Anencephaly with diaphragmatic hernia in sibs

SUMMARY Two sibs who both had anencephaly and diaphragmatic hernia are reported. The type of diaphragmatic defect seen in anencephaly may differ from the defect seen in other babies. It is important to perform a necropsy in anencephaly.

This paper reports 2 sibs who had anencephaly and a diaphragmatic hernia.

Case report

The mother was 21 and the father 25 at the birth of their first child. Both were healthy, and there was no family history of malformations and no consanguinity.

The first pregnancy was normal until the onset of premature labour at 29 weeks, resulting in a stillborn male child on 20.7.75. Necropsy confirmed craniorachischisis, and also showed a large, 'central', left diaphragmatic hernia through which the entire small intestine and part of the colon were herniated. The left lobe of the thymus was absent, there was only a single lobe in the left lung, and the placenta (260 g) was normal.

The second pregnancy resulted in a 12 week spontaneous abortion on 1.1.76.

The third pregnancy was monitored by amniotic fluid alpha-fetoprotein estimations, ultrasound, and x-rays. The fetus was shown to have anencephaly and hydramnios was present. Labour was induced at 27 weeks, resulting in a stillborn male weighing 550 g on 13.10.76. As well as having anencephaly, the baby was found at necropsy to have a large left diaphragmatic hernia, with the stomach, spleen, and most of the small intestine in the left thorax, the left lung being very hypoplastic. There was a single umbilical artery.

Discussion

Diaphragmatic hernia is not usually familial, but a few such cases have been recorded, and it has been suggested that the defect is inherited recessively in certain animals (David and Illingworth, 1976; Thomas *et al.*, 1976). Anencephaly has frequently been found to recur in sibships, but the combination of the two defects has not previously been reported in successive pregnancies. However, there is a report of monozygous female triplets with craniorachischisis (Scott and Paterson, 1966). The first triplet had a 'centrally situated' left diaphragmatic hernia, with the stomach, intestine, and spleen in the thorax. The second triplet had a hernia which was similar but larger, and the 'medial part' of the diaphragm was absent as well. The third triplet had intact diaphragms. The placenta was triamniotic and monochorionic, there was a linked circulation, and the blood groups were identical.

The origins of the human diaphragm are not entirely clear, but present knowledge has been summarised by Gray and Skandalakis (1972). It may be relevant to the association between anencephaly and diaphragmatic hernia that the septum transversum, which contributes to the diaphragm, descends from the level of about the first cervical somite by about 19 somites. In a series of 56 human specimens of anencephaly recently published (Lemire *et al.*, 1978), and collected, it would appear, partly because of their bizarre nature, 5 had a 'high diaphragm', 4 had eventration of the diaphragm, and 4 had a diaphragmatic hernia. It may be that

these high diaphragms were associated with delayed or incomplete descent of the septum transversum. It is also interesting that in the first of the triplets described above, and in the first case in the present paper, the diaphragmatic defect was described as being 'central'; the second triplet had a similar diaphragmatic defect which extended medially. Diaphragmatic hernias are most commonly posterolateral or, if very large, the diaphragm just consists of an anterior rim, and central defects are unusual. This raises the question of whether the diaphragmatic hernias found in anencephaly are different from the usual variety, and it would be interesting to receive information on this point. Certainly none of the 17 diaphragmatic hernias reported by David and Nixon (1976) were described as 'central'. Such central defects may be due to failure of formation of the pleuroperitoneal membrane leading to a patent pleuroperitoneal canal, though the amount of diaphragm to which the membrane contributes is obscure.

Whether anencephaly with diaphragmatic hernia is a separate entity from anencephaly without it remains to be seen. Close attention to other defects in anencephaly, with a necropsy, is easily justifiable on the grounds that aetiologically distinct entities (Holmes *et al.*, 1976) will otherwise escape detection. There is a suspicion that fewer anencephalics are being necropsied than was previously the case, and if this is true it is unfortunate.

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Symphalangism, short stature, skeletal anomalies, and accessory testis: a new malformation syndrome

SUMMARY A 17-year-old Jewish Sephardi male is described with symphalangism, short stature, multiple skeletal anomalies, and an accessory testis, which appears to be a new malformation syndrome of possible genetic aetiology.

Harvey Cushing (1916), the well known neurosurgeon, investigated a family in which the affected members could not flex the proximal interphalangeal joints of the hand. He recognised that this malformation was genetically determined and coined the term symphalangism. Since then, a number of genetic syndromes have been described (McKusick, 1978) in which symphalangism is one of the major findings. Recently, we had the opportunity to study a young

man who had symphalangism and other multiple malformations not previously reported in conjunction with this hand abnormality. The purpose of this report is to give an account of what appears to be a new malformation syndrome.

Case report

A 17-year-old Jewish Sephardi male was referred to the Pediatric Endocrinology Clinic of the Sheba Medical Center for evaluation of short stature. The patient's past history was unremarkable.

Physical examination showed a short, well proportioned young man who measured 146 cm in height. His arm span was 139 cm, head circumference 56 cm, and he had a normal upper segment/lower segment ratio. Vital signs were normal. Positive physical findings included the following: short stature, mild acrocephaly, webbing about the upper and lower gums, absence of joint creases over the region of the dorsal surface of the proximal interphalangeal joints of the fingers, but not the thumbs, inability to flex the proximal interphalangeal joints of the hands (Fig. 1), and three testes, two on the right and one on the left (Fig. 2). No other abnormal physical findings were noted.

Radiographic studies showed mild acrocephaly (Fig. 3), lumbar scoliosis, malformed L5 vertebra, coxa valga, bone age of 14 years, and decrease in space with partial fusion of the proximal interphalangeal joints of digits 2, 3, 4, and 5 of the hands. Radiographic studies of the feet were normal.

Chromosome studies showed a normal male karyotype (46,XY). Serum growth hormone and testosterone levels were within normal limits, as were other routine laboratory tests.

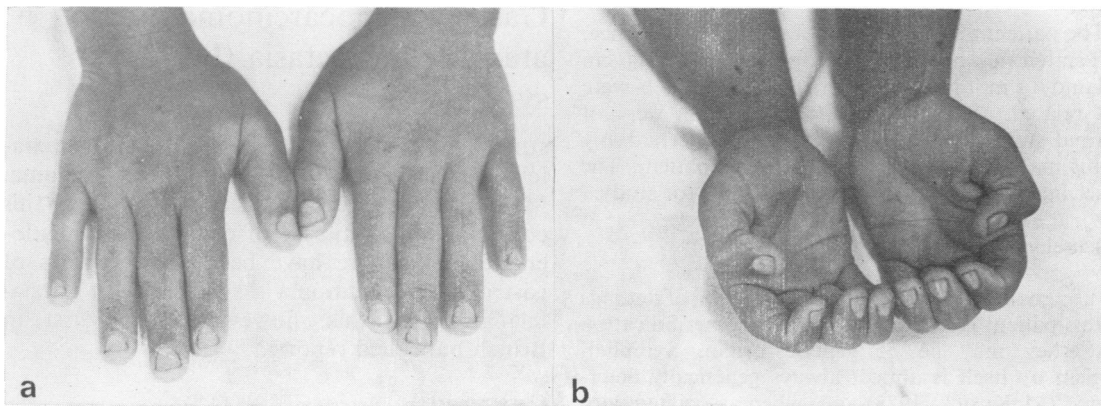


Fig. 1 (a) Note the absence of skin creases over the region of the proximal interphalangeal joints of all fingers except the thumbs. (b) Proband unable to make a fist because of symphalangism of the proximal interphalangeal joints of the hands.