An important question in familial translocations is the mode of segregation and its implications for genetic counselling. The relative frequency of unbalanced gametes depends both on the type of the multivalent formed and its orientation on the metaphase plate, but the more important factor for predicting the prospective risk for carriers of a reciprocal translocation is the degree of possible resulting chromosomal imbalance. In reciprocal translocations causing trisomy for distal 12q, the centric segments are larger than the translocated ones and all the probands result from adjacent 1 segregation, which, in such a situation, would cause the least imbalanced karyotypes at birth. Another factor to be considered is the sex of the carrier parent. In seven of the 10 affected families trisomy for the distal region of 12q was the consequence of a maternal translocation. This preponderance of maternal origin has also been noted for other trisomies due to malsegregation of the 3:1 type, but is not common among translocations of the 2:2 type.³ As mean maternal age is not increased and there is no obvious bias of ascertainment, the more probable determining factor is the difference between male and female meiosis which results in decreased fertility or even sterility among men carrying these rearrangements. This was noted in the family history of some probands.^{7 10}

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Fraser syndrome presenting as monozygotic twins with bilateral renal agenesis

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SUMMARY Fraser syndrome without cryptophthalmos is described in monozygotic twins concordant for bilateral renal agenesis.

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The cryptophthalmos syndrome is an autosomal recessive condition,¹ the main features of which are cryptophthalmos, ear and nose anomalies, cutaneous syndactyly, genital malformations, laryngeal stenosis, and renal anomaly.²⁻⁴ Because

Case reports

cryptophthalmos appears not to be an essential component of the syndrome, the designation Fraser syndrome is preferable and has been previously advocated.^{2,5,6}

Concordant monozygotic twins with bilateral renal agenesis have been described only once.⁷ This report provides a description of monozygotic twins concordant for bilateral renal agenesis with additional malformations suggestive of Fraser syndrome, so that this very unusual association is readily explained by an autosomal recessive mode of inheritance.

Case report

The mother was a 30 year old gravida 3, para 2+0. Five years earlier she had had a normal female infant at term weighing 3.46 kg, and three years previously she had had a normal male infant at 39 weeks' gestation weighing 3.75 kg. She had a seronegative polyarthropathy but was on no medical treatment other than folic acid and iron supplementation. Insulin dependent diabetes mellitus affected her maternal grandmother and aunt. Her husband was 36 years of age and in good health. They were not related. Three of their parents came from the west coast of Ireland. There was no family history of renal abnormalities.

In this pregnancy she presented at 11 weeks' gestation. Ultrasound examination showed the presence of twin pregnancy compatible with her dates. A second ultrasound at 27 weeks' gestation revealed only one fetal heart and a diagnosis of missed abortion of the crumpled co-twin was made. Repeat ultrasound at 32 to 37 weeks suggested increasing growth retardation of the surviving twin. Just before 38 weeks' gestation elective Caesarian section was performed for severe oligohydramnios and abnormal cardiotocograph tracing. At Caesarian section a severely abnormal looking female infant was delivered, weighing 2.15 kg. A fetus papyraceous was also present. The liveborn infant had typical Potter's facies with compressed ears, small nose and chin, a characteristic epicanthic fold, an aged appearance, and large spade-shaped hands with partial syndactyly of the third and fourth fingers. There was no evidence of cryptophthalmos. The external genitalia were female and there was marked hypertrophy of the clitoris with partial fusion of the labia majora anterior to the vaginal opening. This twin survived for 32 minutes.

The placenta was a single disc with a monochorionic diamniotic septum. The portion of the placenta corresponding to the liveborn infant showed cord oedema and prominent amnion nodosum. The other side of the placenta contained a fetus papyraceus

with bilateral renal agenesis. The fetus papyraceus had a foot length of 2.4 cm suggesting that it survived until approximately 16 weeks' gestation. Necropsy findings of the liveborn infant revealed bilateral renal agenesis with absence of ureters and bladder. The uterus was hypoplastic. Additional abnormalities included laryngeal stenosis, abnormally short small intestine, wide fontanelles with polymicrogyria, single left palmar crease, and partial syndactyly of the third and fourth fingers bilaterally. Ocular histopathology was normal. The cause of death was postpartum asphyxia due to pulmonary hypoplasia, and this was manifested by epicardial and subpleural petechial haemorrhages. Cytomegaly was present in the fetal adrenal cortex bilaterally. Chromosome analysis revealed a normal female karyotype.

Discussion

This is the second recorded case of monozygotic twins concordant for bilateral renal agenesis and an interesting sequel to the earlier report from this unit.⁷ These and other reports of sibships in which more than one subject has been affected⁸ provide evidence for a genetic component in the aetiology of bilateral renal agenesis, but in this case the presence of associated malformations suggests that the renal agenesis was part of an inherited syndrome.

A large family study of renal agenesis by Carter *et al*⁸ included a male index case with bilateral renal agenesis and unilateral cryptophthalmos whose sister also had bilateral renal agenesis with syndactyly and laryngeal atresia. Cryptophthalmos syndrome was put forward as a possible diagnosis and further support for this suggestion came later with the birth of another child with bilateral renal agenesis, laryngeal obstruction, and deficiency of the medial third of one upper eyelid.⁵ This demonstrated that cryptophthalmos is not an invariable component of the cryptophthalmos syndrome and prompted the authors to suggest that Fraser syndrome would be a more appropriate name.

In our family the liveborn twin had syndactyly and laryngeal stenosis so that Fraser syndrome is again a likely diagnosis. This condition is inherited as an autosomal recessive trait which would readily explain the rare association of bilateral renal agenesis in monozygotic twins.

This report provides further evidence that cryptophthalmos is not an essential component of the cryptophthalmos syndrome and we would support the view that Fraser syndrome is a better name for this condition. In cases of bilateral renal agenesis this is an important diagnosis to consider because of the much increased recurrence risk, and the features

of this syndrome should be excluded by careful necropsy examination. It has been pointed out that the recurrence rate in bilateral renal agenesis is too high to be explained on the basis of multifactorial inheritance unless estimates of the birth frequency are much too low.⁸ Single gene defects could account for some of this excess and Fraser syndrome is one likely candidate.

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Familial opposable triphalangeal thumbs associated with duplication of the big toes

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SUMMARY A rare association of triphalangeal thumbs and duplication of the big toes is described. The family pedigree confirms autosomal dominant inheritance with marked penetrance. A systematic approach to the diagnosis of this anomaly is presented. The distinction between the two types of triphalangeal thumb, true (opposable) and finger-like (non-opposable), is emphasised.

A triphalangeal thumb is defined as a thumb with three phalanges in a row. This is a very rare congenital malformation. Wood¹ reviewed published reports and found 362 patients with 630 triphalangeal thumbs. About two-thirds of these cases had a family history.¹ However, the familial occurrence of opposable triphalangeal thumbs with duplication of the big toes has rarely been reported.²⁻⁵ We wish to report a family with this anomaly and to suggest a systematic approach to the infant with triphalangeal thumbs.

Case report

The family pedigree is shown in fig 1. The first child

(V.1) was born in 1981 after a normal pregnancy and delivery to a 30 year old, G2, P1, A1 healthy mother. The parents were unrelated. The pregnancy was normal. There was no history of any medication, alcohol intake, or smoking during pregnancy.

Physical examination revealed a healthy female infant with malformations of both thumbs and big toes. Both thumbs were affected symmetrically. They appeared long with an additional interphalangeal joint and an extra set of skin creases. The thenar region, the first web space, and the nail were

FIG 1 Family pedigree.

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