

(q11;p13). The study of polymorphisms in previous generations of the family might have helped resolve the origin of the abnormal chromosome but this was not possible.

In patients found to have a twin pregnancy, amniocentesis is likely to be attempted at a later gestation than usual. In these circumstances it appears advisable to carry out preliminary parental karyotyping and thus avoid the situation described.

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Leprechaunism with mosaicism 46,XX/47,XX extra ring chromosome

SUMMARY A case of leprechaunism with a chromosomal abnormality is reported. The patient was a female infant, born to healthy, consanguineous young parents. Her course was one of extreme marasmus, with death at 3

months of age. She presented the classical features of the syndrome and chromosome mosaicism 46,XX/47,XX,+r(?). It was not possible to identify the origin of the extra ring chromosome. It is difficult to establish the role of such a cytogenetic finding in the aetiology of the syndrome.

This report concerns a female infant with the clinical features of leprechaunism, whose chromosome complement was mosaic. One cell line was normal while the other included 47 chromosomes, the additional chromosome being a small ring. This is the first instance in which an infant with leprechaunism has been found to have such abnormal karyotype.

Case report

The patient was born at term to healthy parents who are second cousins. The father was 30 years old when the infant was born, the mother 26. The mother had had five previous pregnancies. Four had been normal offspring while one had ended in a spontaneous abortion. The pregnancy which produced the proband was uncomplicated. The infant's birthweight was 3750 g and the length was 51 cm. The infant was cyanotic. The facies was grotesque, with hypertelorism and oblique palpebral fissures. The nasal bridge was broad and flat, and the nostrils large. The lower lip was thick and everted. The palate was widely cleft. Other abnormalities included occipital prominence; low set, oblique ears with obvious malformations of the lobules (Figs. 1 and 2); and extension of the scalp hair over the forehead. In addition, fine lanugototype hair was noted in the preauricular areas, and on the arms and back. The nipples appeared to be normal but were low and widely placed. The external genitalia were prominent. The infant was hypertonic and maintained an opisthotonic posture lying on her side. The hips were held in a position of adduction. Both feet revealed an equinovarus malformation with the third toes overlying the fourth. The fists were held tightly clenched. A simian crease was present on each palm. The skin was inelastic, forming prominent folds, and subcutaneous tissue was severely deficient.

Laboratory determinations, including urinary amino acid analysis, yielded normal results. X-ray films revealed a narrow pelvis (Fig. 3), and advanced skeletal maturation. The bone age was 6 to 9 months when the infant was 2 months old, on the basis of the evaluation of carpal and tarsal ossification centres.

The infant's course was one of progressive marasmus and she died at the age of 3 months.



Fig. 1 Front and lateral view of the patient, showing the typical grotesque facies.

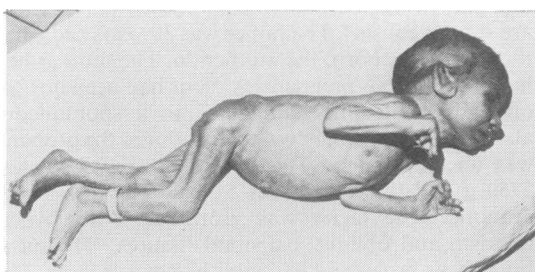


Fig. 2 General appearance, showing the opisthotonic position and the contractures.

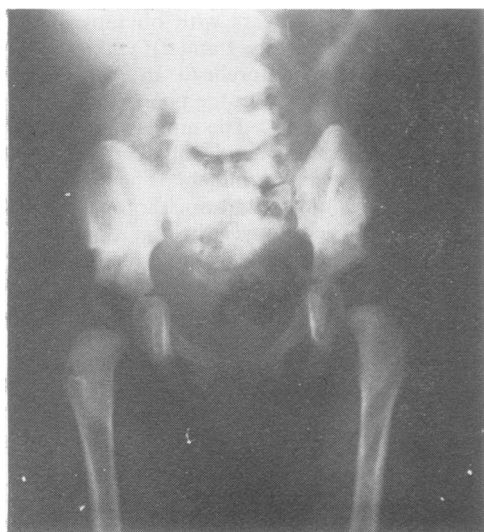


Fig. 3 X-ray film showing narrow pelvis and advanced bone age.

CYTOGENETIC FINDINGS

Lymphocytes were cultured by standard methods. (Moorhead *et al.*, 1960). Trypsin-Giemsa staining was employed to produce chromosome banding (Seabright, 1972). Two cell lines were observed; one normal 46,XX, the other including 47 chromosomes. The accessory chromosome (Fig. 4) appeared to be a small ring, the origin of which could not be determined. It was noted in 52 of 102 lymphocytes analysed, and its morphology was variable. A buccal smear was X-chromatin positive. Karyotypes of the parents were normal.

Discussion

Leprechaunism is a rare syndrome, characterised by unusual, grotesque facies, multiple other malformations, progressive marasmus, and early death (Donohue and Uchida, 1954). Evidence suggests that it is genetically determined, and in some families appears to conform to an autosomal recessive mode of inheritance. Functional and morphological endocrine abnormalities have been described; cystic follicles of the ovaries have been prominent

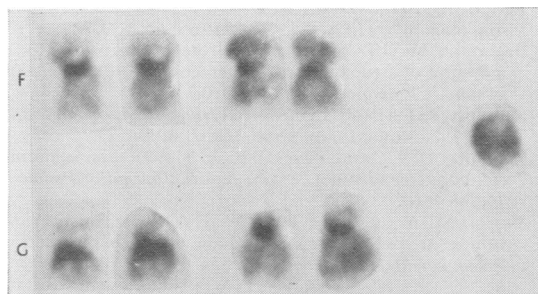


Fig. 4 Partial karyotype of patient showing the extra ring chromosome (on the right) compared with F and G group chromosomes.

Table 1 Chromosome counts on lymphocytes

Chromosome number	44	45	46	47r	Total
Proposita		2	48	52	102
Mother	2	1	77		80
Father	3		77		80

findings (Patterson and Watkins, 1962; Kallo *et al.*, 1965; Summitt and Favara, 1969).

Table 1 summarises the principal features of leprechaunism and compares the features of the case reported herein. The phenotype of our patient is strikingly similar to those of previously reported infants with leprechaunism. An unusual feature of our case was the advanced bone age detected on *x*-ray examination. Such a feature may be the result of early elaboration of sex hormones, which could also explain the observed enlargement of the external genitalia.

The karyotype of the patient was most unusual. Ring chromosomes of the X and of several autosomes are known to occur. However, the ring is ordinarily one of a complement of 46 chromosomes, and not present as a 47th chromosome producing partial trisomy. The only reports, to our knowledge, in which the ring chromosome constituted an extra chromosome producing partial trisomy are those of Atkins *et al.* (1966), and of Varela and Sternberg (1969). In neither of the patients in those reports was the phenotype reminiscent of leprechaunism.

To date very few cases of leprechaunism have been reported: in only one was a chromosomal abnormality demonstrable (Ayraud *et al.*, 1976). If leprechaunism is a distinct entity, inherited in an autosomal recessive manner as has been proposed (Summitt, 1974; McKusick, 1971), then it is possible that the phenotype of our patient and the chromosomal abnormality are coincidental. Our patient could be homozygous for the recessive leprechaunism gene, especially in view of the fact that her parents were consanguineous. On the other hand, it seems reasonable to attribute the patient's phenotype to the chromosomal aberration. One previous report (Summitt and Favara,

Table 2 Characteristics of leprechaunism* and comparison with present patient

	Frequencies	Personal
Sex ratio	M:1 F:3	F
Grotesque facies	8/8	Yes
Flat nasal bridge and flaring nostrils	8/8	Yes
Thick prominent lips	5/8	Yes
Large low-set ears	8/8	Yes
Hirsutism	5/8	Yes (mild degree)
Enlargement of breasts	6/8	Absent
Prominent clitoris and labia minora	6/8	Yes
Excessive folding of skin, deficiency of subcutaneous tissue	6/8	Yes
Motor and mental retardation	8/8	Yes
Severe failure to thrive	8/8	Yes
Death in early months of life	7/8	Yes (3rd month)
Consanguinity		Yes

*Findings based upon review of 8 cases collected by Summitt (1974).

1969) has suggested that leprechaunism is an aetiologically heterogeneous 'physical examination syndrome'. This idea is supported by the variation in the phenotypes of patients reported with leprechaunism, and the lack of a demonstrable metabolic defect common to all patients. Moreover the only case of Ayraud *et al.* (1976) with a chromosomal abnormality showed a karyotype quite different from our report. We believe that further evidence is required to establish this rare syndrome as a distinct entity. Reported cases should be documented with adequate cytogenetic and metabolic investigation.

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