

toes can show hypoplasia or agenesis of the distal phalanges. The patients described by Hughes and Partington² and Partington³ had less severe digital anomalies. These patients had, in addition, soft tissue syndactyly of the fingers and toes. All patients had deficient scalp hair and nearly all had nail hypoplasia or agenesis. Other ectodermal anomalies are found in tooth and nipple formation. The patients that died in the neonatal period are not known to have had skin anomalies. The patient of Partington³ had a dry skin with episodic peeling over the fingers. This patient also had a cardiomyopathy, which caused an irregular heart rhythm in utero. One of the surviving patients is severely retarded, but the other seems to have normal intellectual development at the age of three years.³

The differential diagnosis includes cleidocranial dysostosis,⁴ but there is also some overlap with Roberts' syndrome.⁵ A more extensive review of anomalies associated with clavicular hypoplasia or agenesis can be found elsewhere.⁶ The presence of the syndrome with equal severity in sibs of both sexes, the similarity of symptoms in all cases, the absence of reports of the syndrome in more than one generation, and the consanguinity in three of the six families described point to an autosomal recessive mode of inheritance. The finding of shortening of the thumbs and distal phalanges in the mother of the present patient could be interpreted as an expression of the gene in the heterozygote. No such anomalies were found in the parents of the other

patients, but radiological investigations were not performed, so it remains uncertain whether these anomalies could occur more often.

We wish to thank Professor M W Partington, (Ontario, Canada) and Dr H E Hughes (Cardiff) for additional information on their patients, F A M Hennekam for pedigree analysis, and F J Van Waert for excellent technical assistance.

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A case of interstitial deletion of 10q25.2→q26.1

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SUMMARY A de novo interstitial deletion of chromosome 10, del(10)(pter→q25.2::q26.1→qter), was detected in a newborn female with facial anomalies, failure to thrive, and subsequent developmental delay. This case is compared with 10 previous reports of monosomy 10q within the q25→qter region.

Case report

The proband (fig 1) was the first child of unrelated parents, both in their twenties and from large families with no history of congenital malformation. The pregnancy was uneventful except for a varicella

infection at six weeks, and labour was induced five days after term producing a liveborn, 2960 g female. Respiratory effort was poor with Apgar scores of 3 at one minute, 6 at five minutes, and 9 at 10 minutes. There was some meconium staining of the liquor.

The baby was noted to be of unusual appearance, microcephalic, and brachycephalic. She also had poor muscle tone. Facial features included hypertelorism, prominent, broad nasal bridge, thin, bow shaped upper lip, long philtrum, long, narrow face, and poorly developed jaw angles. The only other abnormal finding was bilateral, flat, hypoplastic labia majora. The baby failed to thrive for 10 days after birth.

Later review at six months of age showed that

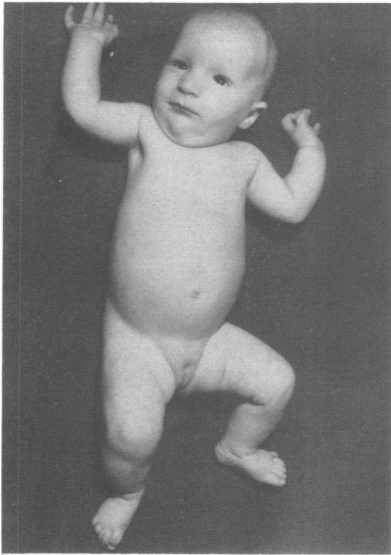


FIG 1 The proband aged eight months.

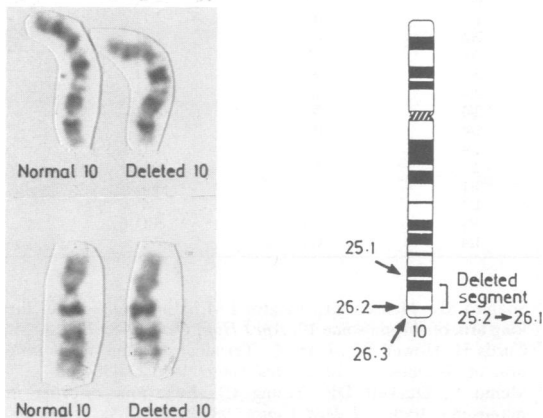


FIG 2 Partial karyotype of the proband showing the interstitial deletion 10 (q25.2→q26.1).

while the weight remained just below the 10th centile, both the length and biparietal diameter were below the 3rd centile. Developmental assessment put her at the three month level.

At two years she was achieving developmental skills at approximately half her chronological age, with the benefit of the Portage scheme of developmental stimulation. Socially she is withdrawn and slow to smile, but she has no other features suggestive of autism.

CYTOGENETIC STUDIES

Chromosome analysis was performed on peripheral

blood lymphocyte cultures 12 days after birth. Giemsa banded preparations showed an interstitial deletion of chromosome 10 (fig 2) from q25.2 to q26.1. Parental karyotypes were normal. The full karyotype was designated 46,XX,del(10)(pter→q25.2::q26.1→qter).

Discussion

There have been several published reports of partial monosomy 10q.¹⁻¹⁴ However, comparisons between them have so far failed to show sufficient consistent features to suggest a recognisable syndrome. Some of these reports describe derivative chromosomes from familial rearrangements,^{8 10-12} and therefore some inconsistencies may arise from the comparison of these double aneusomies with the true de novo deletions. Thus, a collation of data from cases of true 10q- should provide more uniform information with which to reappraise the possibility of a syndrome. Until now there have been very few such reports.

The present case represents the 11th case of true partial monosomy 10q within the q25→qter region, although it is, to our knowledge, the first interstitial deletion to be described.

The principle features described by previous authors together with those seen in our proband are summarised in the table. The data have been separated according to breakpoints, either q25 or q26, to highlight any phenotypic differences that may be attributable to the loss of a specific chromosome region.

There appears, however, to be little difference between features associated with the two breakpoints although it is difficult to draw conclusions on so few data. It would seem that the q25 deletion may increase the tendency to brachycephaly, rotated ears, widely spaced nipples, anomalies of the hands and feet, anogenital defects in females, and congenital heart defect. However, not all of these are found in our interstitial deletion case, so these features may result from an additive effect of losing q25 and the q26→qter regions rather than from loss of q25 itself.

Two authors^{5 6} draw attention to the recent localisation to 10q25.3 of the human GOT1 (glutamate oxaloacetate transaminase) structural gene.¹³ In both cases the deleted segments were from q26, and in both cases GOT1 activity was normal. Evans-Jones *et al*⁵ also tested PGAMA (phosphoglycerate mutase) activity and this too was normal. These data confirm that the two loci are proximal to q26. The interstitial deletion of q25.2→q26.1 in our case would presumably affect activity of these two enzymes if the loci are within this region, and it is

TABLE Clinical features of our patient compared with the other cases of partial monosomy 10q.

| Features scored | | q26→qter ^{1 4-7 9} | q25→qter ^{1 3 8 14} | q25.2→q26.1 (present case) | Total |
|---------------------------------|-----------|-----------------------------|------------------------------|-------------------------------|-------|
| Sex | Male | 3/6 | 1/4 | | 4/11 |
| | Female | 3/6 | 3/4 | 1/1 | 7/11 |
| Gestation: | Term | 3/6 | 2/4 | | 5/11 |
| | Preterm | 2/6 | 1/4 | | 3/11 |
| | Post-term | 1/6 | 1/4 | 1/1 | 3/11 |
| Respiratory distress | | 4/6 | 2/4 | 1/1 | 7/11 |
| Growth retardation | | 5/6 | 4/4 | 1/1 | 10/11 |
| Psychomotor retardation | | 6/6 | 4/4 | 1/1 | 11/11 |
| Microcephaly | | 3/6 | 4/4 | 1/1 | 8/11 |
| Brachycephaly | | 0/6 | 2/4 | 1/1 | 3/11 |
| Triangular facies | | 3/6 | 0/4 | 0/1 | 3/11 |
| Hypotonia | | 3/6 | 1/4 | 1/1 | 5/11 |
| Hypertelorism | | 3/6 | 2/4 | 1/1 | 6/11 |
| Strabismus | | 3/6 | 1/4 | 0/1 | 4/11 |
| Deep set eyes | | 2/6 | 0/6 | 0/1 | 2/11 |
| Palpebral fissures | | | | | |
| Upward slanting | | 0/6 | 2/4 | | 2/11 |
| Downward slanting | | 1/6 | | | 1/11 |
| Level | | 1/6 | 1/4 | 1/1 | 3/11 |
| Broad, prominent nasal bridge | | 4/6 | 4/4 | 1/1 | 9/11 |
| Small nose, wide based, | | | | | |
| anteverted nares | | 3/6 | 0/4 | 0/1 | 3/11 |
| Thin or Cupid bow upper lip | | 3/6 | 2/4 | 1/1 | 6/11 |
| Long philtrum | | 1/6 | 1/4 | 1/1 | 3/11 |
| Poorly developed jaw angles | | 1/6 | 1/4 | 1/1 | 3/11 |
| Malformed, rotated ears | | 0/6 | 4/4 | 0/1 | 4/11 |
| Large ears, overdeveloped folds | | 4/6 | 1/4 | 1/1 | 6/11 |
| Low set ears | | 3/6 | 2/4 | 0/1 | 5/11 |
| Short neck | | 3/6 | 0/4 | 1/1 | 4/11 |
| Neck anomalies (eg webbing) | | 2/6 | 1/4 | 0/1 | 3/11 |
| Shield shaped chest | | 0/6 | 2/4 | 0/1 | 2/11 |
| Widely spaced nipples | | 0/6 | 3/4 | 1/1 | 4/11 |
| CHD | | 1/6 | 3/4 | 0/1 | 4/11 |
| Clinodactyly | | 3/6 | 2/4 | 1/1 | 6/11 |
| Talipes equinovarus | | 0/6 | 2/4 | 0/1 | 2/11 |
| Syndactyly toes 2 to 3 | | 0/6 | 2/4 | 0/1 | 2/11 |
| Limited flexion of elbows | | 1/6 | 1/4 | 0/1 | 2/11 |
| Anogenital defects | | 0/6 | 2/4 | 1/1 | 3/11 |
| Cryptorchidism | | 3/3 | 1/1 | — | 4/4 |
| Small penis | | 1/3 | 1/1 | — | 2/4 |
| Alive | | 5/6 | 3/4 | 1/1 | 9/11 |
| Dead | | 1/6 | 1/4 | 0/1 | 2/11 |

intended that such tests will be performed on our patient.

Conclusion

Despite comparison of karyotypically uniform data, the features associated with deletions in the 10q25→10qter region are still too non-specific for a recognisable syndrome to emerge.

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