Duplicate of chromosome 19, partial or complete, has rarely been described. Trisomy of its short arm (19p) was briefly reported in abstract form by Byrne et al in 1980 in a newborn patient with dysmorphism and intrauterine growth retardation and in 1992 by Salbert et al in a dysmorphic newborn male. The delineation of these two patients was hampered by deletion of the terminal band of chromosome 13 in the first case and partial deletion of distal chromosome 3q in the second case.

CASE REPORT

The infant presented here is the first and only child of non-consanguineous parents. The family history is unremarkable apart from epilepsy in the maternal grandmother. The pregnancy was uneventful with no intrauterine growth retardation. The mother and the father were aged 28 and 35 years at the time of birth. He was born at 41 weeks of gestation by spontaneous delivery. He sat alone at 6 months, walked at 17 months, and spoke a few words at 21 months. Mild psychomotor delay and head circumference at $-3$ SD were the reason for referral at 20 months. Craniofacial features included sparse hair, short nose, anteverted nostrils, low set ears, and a long upper lip (fig 1). His behaviour was hyperkinetic with a short attention span. Karyotype was 46,XY. Parental G banded karyotypes on peripheral blood lymphocytes were also normal. However, since the patient had microcephaly and dysmorphic signs we investigated the possibility of a submicroscopic chromosomal rearrangement by multitelomeric FISH analysis using the Vysis TelVysion Probe Panel.

Three copies of the 19p arm probe clone 129F16/SP6 were observed: two hybridised to their normal location on 19p and the third on the telomere of the chromosome 14 long arm. All the other subtelomeric probes were present in two copies and hybridised at their correct location. It keeping with this, one of the chromosomes 14 had hybridisation signals from both the 14q (telomeric IGHV segments) and the 19p probes (fig 2).

Figure 1  Index patient aged 21 months. Note mild facial dysmorphism and sparse hair.

Figure 2  FISH analysis of peripheral lymphocytes: note three signals for the 19p marker.
The karyotype of the infant may therefore be defined as
46,XY,ish der(14)t(14;19)(q32.3;p13.3)(IGHV+;129F16/S6+). The parents have a normal hybridisation pattern for
the 19pter and 14qter probes: 46,XX or 46,XY,ish
(14q32.3)(IGHV × 2, 19p13.3(129F16/S6) × 2).

DISCUSSION

From this analysis it can be concluded that this patient has an
unbalanced karyotype with partial trisomy of chromosome 19
without any apparent corresponding monosomy 14. This is,
therefore, to the best of our knowledge, the first “pure” small
distal 19p duplication reported to date. If we now compare
the clinical features of our patient with those of the two previously
mentioned reports, we see some similarities (Table 1).

The patient reported by Byrne et al* had major intrauterine
growth retardation with severe dysmorphic signs at birth,
including severe microcephaly, upward slanting palpebral fisses,
fused eyelids, malformed ears, ambiguous genitalia, and
bilateral syntactility of the 4th and 5th toes. He developed seizures.
He was found to be partially trisomic for 19p and
partially monosomic for 13q while his mother had a reciprocal
translocation 46,XX,(13;19)(q32;p13.3). The second patient,
a neonate reported in 1992,** had dysmorphic facial features
including sparse hair, normally set ears with pointed helices,
short palpebral fissesures, prominent and broad nasal tip, thin
upper lip, retrognathia, short neck, proximally set thumbs, and
bilateral club feet. He had partial trisomy 19q and deletion of
the terminal band of chromosome 3q on karyotyping
performed on peripheral lymphocytes.

Antverted nares and sparse hair were also observed in
our patient. Apart from these, the phenotype was essentially
mild microcephaly, mild dysmorphic features, and mild develop-
mental delay. When checking de Vries criteria¹ in our
patient, we reached only a score of 1 point for microcephaly
and 3 points if we included facial dysmorphia. In any case,
the cut off score of 4 was not reached which means that the
patient under discussion would not have been eligible for
FISH with multietelomeric probes if these criteria were applied.

In conclusion, an apparently pure de novo duplication of the
terminal short arm of chromosome 19 from 19p13.3 to 19ter
causes mild delay and mild to moderate microcephaly (-3 SD).
It is not associated with significant facial dysmorphia and is
readily detectable by FISH multietelomeric analysis. This case
under discussion provides evidence that a recognisable
phenotype is apparently not always present when a small ter-
mal duplication of the chromosome 19 short arm is present.
More generally, we suggest that this finding should encourage
clinicians not to restrict the indication for FISH with subtelo-
meric probes to patients with moderate to severe mental
retardation and/or multiple congenital anomalies.¹²

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Table 1  Clinical hallmarks of reported cases

<table>
<thead>
<tr>
<th></th>
<th>Byrne et al¹</th>
<th>Salibert et al²</th>
<th>Our patient</th>
</tr>
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<tbody>
<tr>
<td>Short stature (or IUGR)</td>
<td>++</td>
<td>++</td>
<td>–</td>
</tr>
<tr>
<td>Mental retardation</td>
<td>++</td>
<td>++</td>
<td>–</td>
</tr>
<tr>
<td>Microcephaly</td>
<td>++</td>
<td>NS</td>
<td>– 3 SD</td>
</tr>
<tr>
<td>Malformed ears</td>
<td>+</td>
<td>[pointed helices]</td>
<td>+ [low set ears]</td>
</tr>
<tr>
<td>Sparse hair</td>
<td>Not mentioned</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Eye abnormalities</td>
<td>Upward slanting palpebral fissesures</td>
<td>Short palpebral fissesures</td>
<td></td>
</tr>
<tr>
<td>Nose abnormalities</td>
<td>Antverted nares</td>
<td>Prominent, broad nasal tip</td>
<td>Short nose</td>
</tr>
<tr>
<td>Limb abnormalities</td>
<td>4th-5th toe syntactility</td>
<td>Proximally set thumbs, club feet</td>
<td>–</td>
</tr>
<tr>
<td>Cytogenetic abnormalities</td>
<td>dup 19p13.3pter</td>
<td>dup 19p13.3pter</td>
<td>dup 19p13.3pter</td>
</tr>
<tr>
<td></td>
<td>del 13q32-qter</td>
<td>del 3q29-qter</td>
<td></td>
</tr>
<tr>
<td>Additional findings</td>
<td>Heart defect, seizures, ambiguous genitalia</td>
<td>Hypotonia, short neck, telecanthus</td>
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