Studies of the Meiotic Behavior of a Translocation t(10;13)(q25;q11) in an Oligospermic Man

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Summary. An new type of translocation, t(10;13)(q25;q11), is observed in a phenotypically normal male who was examined for subfertility. The meiotic behavior of the rearranged chromosomes indicates that crossing-over is very frequent in a rather small segment such as the short arm of chromosome 13 and constant in the distal band of the long arm of chromosome 10.

Among sterile males the frequency of translocations is slightly increased and has been estimated to be approximately 1—3% (Dutrillaux, 1972). A translocation t(10;13) has been detected in a systematic study of the karyotype of such patients. This report concerns the meiotic behavior of the rearranged chromosomes investigated by various banding techniques.

Case Report

The proband is a phenotypically normal 30-year-old male who was found through attendances at a male subfertility clinic. He had only one child, a normal 6-year-old girl, in 10 years of marriage. There is no history of spontaneous abortion in this family.

Cytogenetic Examination. Analysis of somatic karyotype was made after culture of lymphocytes from peripheral blood. The routinely used R-banding indicated a balanced t(10;13) translocation (Fig. 1). The breakpoints could not be exactly determined before the use of T-banding. This technique showed that the T-positive terminal band of the long arm of chromosome 10 was exchanged with most of the long arm of the chromosome 13 (Fig. 2a). The Q-banding confirmed this interpretation and indicated a positive staining of the centric region of each chromosome 13 (Fig. 2b).

The meiotic chromosomes examined after testicular biopsy showed the existence of 22 elements, one being quadrivalent, in cells at diakinesis-metaphase I. Q-banding (Caspersson et al., 1971) and C-banding (Chandley and Fletcher, 1973) were applied to investigate the exact configuration of the quadrivalent.

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Fig. 1. Balanced t(10;13) translocation of the proband

Fig. 2. a) T-banding of the translocation t(10;13). b) Q-banding of the same cell. The der(13) is associated with a normal chromosome 21.

Two types of associations were detected: a ring figuration (Fig. 3a) in 12 of the 30 analyzable cells, and a chain configuration (Fig. 3b) in the remainder of the cells. The interpretation of these two types of configurations is presented in Figures 3a and 3b.

Very few cells at metaphase II were analyzable and a statistical analysis of segregation during the first meiotic division was not possible. However, a clear asymmetry of the two