Cytogenetic Investigation of Laser-Capture Microdissected Carcinoma In Situ Cells from Testicular Tissue

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A series of cytogenetic investigations of overt testicular germ cell tumours, seminomas and nonseminomas previously revealed a characteristic pattern of chromosomal imbalances. However there were only few studies of carcinoma in situ (CIS), the precursor cell of testicular germ cell tumours of adolescents and young adults. This mainly was due to technical problems caused by a low number of CIS cells located within the testicular tubules surrounded by several other types of germ cells as well as somatic cells. To overcome this problem, we laser-capture microdissected CIS cells from nine cases of CIS, either from tissue without any invasive tumour or from testicular parenchyma adjacent to overt tumours. Prior to detection of cytogenetic abnormalities by high-resolution comparative genomic hybridisation (HR-CGH) analysis, DNA was amplified by degenerate oligonucleotide primed PCR (DOP-PCR) and directly labelled with a mixture of FITC-dUTP and FITC-dCTP. HR-CGH analysis revealed extra chromosome arm 12p material in six out of seven cases with CIS adjacent to overt tumours. These cytogenetical data indicated that extra 12p material is not present in the dormant CIS cell prior to development of an invasive tumour. Thus the gain of extra chromosome 12 material is most likely associated with a more malignant progression of the CIS cell and may not be an early event in the neoplastic transformation. In addition, this study confirmed that laser-capture microdissection followed by DOP-PCR of purified DNA provides good quality material suitable for CGH analysis even in low numbers of scattered cells.