No pathogenic variant was detected in the *BRCA1* gene by sequencing. No large deletion or duplication within or including the *BRCA1* or *BRCA2* genes was detected by MLPA analysis.

DIAGNOSIS

Heterozygous germline mutations in the *BRCA2* gene are associated with the phenotype Breast-ovarian cancer, familial, 2/BROVCA2. A diagnosis of familial/hereditary breast and ovarian cancer syndrome (HBOC) based on the *BRCA2* variant is thus confirmed.

RECOMMENDATIONS

It was suggested that the proband should participate in intensive surveillance programs, and undergo predictive testing. Further, we recommended genetic counselling of the patient and his family members.

DISCUSSION

Male breast cancer (MBC) is a rare cancer, and constitutes only 1% of all breast cancers incidence. Its incidence is approximately one case per 100,000 man-years. Only up to 10% of all the MBCs cases may be attributed to germline mutations in HBOC associated genes [mutations in *BRCA 1/2*, *PTEN* tumor suppressor gene, *TP53* mutations (Li-Fraumeni syndrome), *PALB2* mutations, and mismatch repair mutations associated with hereditary nonpolyposis colorectal cancer (Lynch syndrome)]. Risk factors for MBC include diseases associated with hyperestrogenism [such as cirrhosis, or Klinefelter's syndrome (47XXY karyotype)], testicular dysgenesis, gynecomastia, low testosterone concentrations, increased gonadotrophins, and major inheritance susceptibility [HBOC associated genes].

BRCA1 and *BRCA2* are protein coding genes. Their proteins function as tumor suppressors which are pivotal in repair of double-strand DNA breaks by homologous recombination. The BRCA1 protein regulates genomic integrity (cell-cycle control, mitotic spindle assembly, centrosome duplication, and chromatin remodelling) at sites of double-strand DNA breaks. The *BRCA2* protein primarily regulates RAD51 recombinase which functions in DNA repair. Tumours with *BRCA2* mutations usually exhibit loss of heterozygosity (LOH) of the wild-type allele.