SYNGENIC GRAFTING OF A WHOLE MALE JUVENILE GONADAL TISSUE INTO THE ADULT TESTES CONFFERS SUCCESSFUL SPERMATOGENESIS IN MICE

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Grafting of testis tissue from neonatal mouse and pig under the skin or into the testes revealed that the gametogenic competence of the testis graft can be maintained. In this study, we report that functional spermatozoa could be obtained when a whole male gonadal tissue (testes, epididymides and fat) isolated from fetal or neonatal mice was grafted underneath adult mouse testes. Fetal (E 15.5) or neonatal (1-day-old) male gonadal tissue isolated from GFP-transgenic mice (C57BL/6-Tg(ACTB-EGFP)1Osb/J) was deeply inserted into a testis of non-fluorescent C57BL/6J recipient mouse through the incision of the tunica albuginea. On the other hand, these testes with epididymides were also kept near the incision of the tunica albuginea. At 2 months after transplantation, grafted testes were retrieved from recipient mice. Histological analysis demonstrated that spermatogenesis occurred in 30~60% of each seminiferous tubules of all the grafted testes. Interestingly, motile spermatozoa could be successfully retrieved from the cauda epididymides of grafted testes. When these spermatozoa were frozen-thawed and subjected to intracytoplasmic sperm injection (ICSI), normal pups were successfully obtained. This technique will thus be used to rescue transgenic mice with lethal postnatal phenotype and probably preserve endangered animals.