Jet Injection Delivery of a Combined Contraceptive and Testicular Function Inhibitor into the Epididymis and Testicular Tissue

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A chemical complex of Styrene maleic anhydride and Dimethyl sulphoxide in one form known as RISUG® has been toxicologically evaluated for safety in delivery into the male reproductive tract and is currently in human clinical trials as a vas deferens-delivered contraceptive. Experimental observations in the rat and the monkey indicate that the drug injected into the epididymis forms a stable implant which by pH lowering, electrical charge generation, and physical obstruction of the epididymal duct leads to azoospermia and contraception. If the drug is delivered into the testes, in addition to the pH lowering and electrical charge effects, there is impediment to testicular blood circulation, all of which together leads to regression of the seminiferous tubules along with the Sertoli cells and the testicular interstitial tissue and its contained Leydig cells. Thus, the source of testosterone production is depleted.

To achieve the dual objective of contraception and testosterone production suppression, a novel multijet arrayed injector has been developed. The device comprises eight jet injector needles positioned such that the needles encircle the scrotum from the outside. In use, by a quick inward movement, the needles penetrate the skin and RISUG® diluted with a mixture of methyl alcohol, ethyl alcohol and benzyl alcohol is delivered into testicular tissue as a jet via the needle array. Thereby, RISUG® implants can be formed in the epididymis and a large part of the testes. The delivery action time is very short and two arrays can be made to encircle both testes concurrently and minimize the time required for animal handling. The formulation includes an anesthetic component to minimize post-procedural pain.

Epididymal and testicular injection in the rat and the monkey leads to absence of sperms in the vas deferens and marked reduction of testicular size. Also, the rats, which prior to the injection had ejaculation on rectal electrostimulation, failed to ejaculate after the RISUG injection, thus indicating an androgenic suppression. Similarly, monkeys following the injection failed in penile electroejaculation. These observations lead to the conclusion that the novel method is potentially a good technique for obtaining contraception and testicular tissue regression and is likely to be quite effective in male dog sterilization. *(Patent application pending)*