

## INTRATESTICULAR CHEMICAL CASTRATION WITH ZINC CHLORIDE IN MALE CATS

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The aim of this study was to evaluate the clinical safety and efficacy of a single intratesticular injection of zinc chloride in causing sterility of male adult cats. Chemical castration is a solution for pet overpopulation and for non-surgical methods of male sterilization. Surgical castration has some disadvantages: it is not cost-effective and is time-consuming, with risk of post-operative complications.

Sixteen male cats of mixed breed, aging from one to three years old and weighing between 3.5 and 5.0 kg, were selected in this study. The 16 male cats were divided into four groups of equal size. Four male cats of each treatment group were given a single bilateral injection of either low dose (20 mg), mid dose (40 mg) or high dose (80 mg) ZnCl<sub>2</sub> 0.2 ml/per testis. Two of four control male cats received only a single bilateral intratesticular injection with 0.2 ml sterile saline per testis, and another two male cats were untreated. All animals were examined for testicular size (mm) with caliper and ultrasonographic measurement; blood serum testosterone levels (ng/ml), urine parameters and spermatological traits were evaluated before ZnCl<sub>2</sub> injections, on day 0 (day of treatment), and then every 20 days for 60 days. Semen was collected from the male cats by means of a specially adapted electro-ejaculator (P-T Electronics, Model 302, Boring - Oregon, USA). All male cats were anaesthetized with either xylazine (2 mg/kg) in combination with ketamine-HCl (10 mg/kg) during the electro-ejaculation protocol and single dose intra testicular injection. Spermatological traits were evaluated for volume (ml), sperm motility (%), and abnormal morphological rates (%). After 60 days the testes were surgically removed. The right and left testis from each animal were used for histomorphological studies. General attitude, appetite, ability to walk, scrotal pain, rectal temperature, and scrotal evaluation beyond swelling were assessed daily on days 1-7 post-injection.

No change in eating habits or body weight was observed following injection. No scrotal pain occurred on the first day post-injection. Mild swelling was observed in all male cats by 24 hours, reached a maximum at 48 hours after injection, and decreased by 20 days. There was no significant change in rectal temperature on the 7 days post-injection. Abnormal attitude and abnormal appetite were not seen, and no difficulty with walking after injection was recorded for any of the male cats. There were no significant changes in urine parameters at 20, 40, and 60 days post-injection. The mean plasma testosterone concentrations were 0.25±0.33 ng/ml in the low dose at 60 days post-injection compared to mean plasma testosterone concentrations of 1.31±0.73 ng/ml and 2.09±1.13 ng/ml in the mid and high dose group at 60 days post-injection, respectively (p<0.05). Testicular size was reduced in low dose group but there were no significant changes in testicular size in mid and high dose groups at 60 days post-injection. Testicular histology showed the degenerative changes associated with the low dose group and resulted in necrosis of the germinal epithelium of the semiferous tubules and interstitial Leydig cells, but mid and high dose groups showed only necrosis of the germinal epithelium. Semen collection

was attempted in all male cats at 20, 40, and 60 days post-injection. There were no spermatozoa in semen samples from any dose group.

We didn't expect the results of low testosterone level when we treated the low dose group. Zinc chloride is a mineral that has a protective effect on cell membrane. We guess that high dose of ZnCl<sub>2</sub> may protect and support the structure of leydig cells. To understand our hypothesis, we need to investigate again the same doses of ZnCl<sub>2</sub> and should look at testis structure by histopathology and testosterone levels on a higher number of male cats. Results indicate that intratesticular injections of low, mid and high dose zinc chloride are an extremely effective method for non-surgical chemical castration of male cats.