Comparison of cauda epididymal sperm morphology following surgical vasectomy or chemical epididectomy in feral horses
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Introduction
Following surgical vasectomy or ductal occlusion, epididymal distension with changes to the interstitium occur. In laboratory animals, pressure-mediated damage to the seminiferous epithelium can also follow. Surgical vasectomy and chemical epididectomy are two methods under investigation for use to control feral horse populations. The objective of this study was to determine if either method induced significant changes in spermatogenesis. The hypothesis was that surgical vasectomy and chemical epididectomy would increase the percentage of abnormal sperm present in the tail of the epididymis.

Methods
Stallions used in this study were part of the feral horse herd managed in accordance with the U.S. Fish and Wildlife Service comprehensive conservation plan for the Sheldon National Wildlife Refuge. Stallions were either surgically vasectomized (n=9), chemically epididectomized (n=11) or untreated (n=11) in the five years prior to this study. For the chemical epididectomy, 10 ml of 1% chlorhexidine in 90% DMSO (v/v) was injected into the tail of each epididymis. In 2013, stallions were gathered for routine castration. Immediately following castration, testes, epididymides and vas deferens were examined and any abnormalities found were noted. Next, a sample of fluid from the tail of each epididymis was mixed with eosin-nigrosin morphology stain, spread with a spreader slide, and allowed to air dry. The slides were evaluated blindly under oil immersion (1000X) without a coverslip using bright field microscopy and the percentage of sperm with abnormal morphology was determined. The effect of treatment on sperm morphology was compared using a one-way ANOVA test. Statistical tests were performed using Graph Pad Prism (LaJolla, CA). Significance was defined as p<0.05.

Results
Both surgically vasectomized males (64.8±7.8%) and the males receiving a chemical epididectomy (53.6±10.7%) exhibited significantly more abnormal sperm than normal males (40.3±4.6%; p<0.05). In addition, the number of abnormal sperm in vasectomized males was significantly greater than the number in the chemically treated males (p<0.05). The majority of the defects recorded in all groups were detached heads, bent tails, and coiled tails.

Discussion
Both surgical vasectomies and chemical epididectomies in stallions lead to significant increases in abnormal sperm and have potential for use in controlling feral horse populations. Histopathology studies are underway to determine the etiology of the observed effects on spermatogenesis.

Keywords: Epididectomy, equine, sperm morphology, vasectomy

References