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Author

Buyukmihci, NC

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Castration for Population Control of Macaques In a Sanctuary Setting

Nedim C Buyukmihci, V.M.D.¹

Summary

This paper discusses the use of castration as a means of population control for non-human primates where other means may be inefficient, ineffective or otherwise problematic. It is anecdotal in nature, using my experience and some reference to scientific studies for support.

Keywords: castration, macaques, monkeys, non-human primates, orchidectomy, population control, sanctuary, sterilisation (sterilization), wildlife in captivity

The intent of this manuscript is to document my experience using castration as a means of population control at a sanctuary for non-human primates. I believe this to be important because of the strong resistance to castration in the non-human primate rescue community based on substantial erroneous assumptions, misinformation and myths. It is meant to be instructive rather than casting aspersions on people who are dedicated to helping non-human primates.

It is paramount that sanctuaries that rescue and provide life-long homes to non-releasable non-human primates do not allow any reproduction unless they are actively involved in breeding for release of progeny into a free-living state in natural habitat as part of a conservation program. To allow reproduction would be ethically, fiscally and biologically irresponsible. There is increasing societal pressure to ban the keeping of non-human primates as 'pets' and many laboratories are either discontinuing using these individuals in research or are attempting to find permanent homes for them after studies have ended. It is unquestionable that non-human primates in captivity have poor welfare and well-being². As a result, it is an important animal welfare issue that no non-human primate being considered for re-homing to a reputable sanctuary, albeit still captivity, should be turned away simply because the sanctuary has failed to control reproduction and no longer has room or other resources as a result.

My experience with this issue comprised over five years as co-manager of a non-human primate sanctuary in Texas where over 600 individuals were provided a permanent home. Prior to this facility becoming a sanctuary, it had been an "observatory" comprising Japanese macaques (*Macaca fuscata*) and breeding was permitted, if not encouraged³. Although previous attempts had been made to reduce reproduction by vasectomising some of the males, the new sanctuary was faced with hundreds of sexually intact individuals with many dozens of new births occurring each year, putting a severe strain on financial and other resources.

In this setting, where most of the individuals were free-living in fenced, open-topped, densely vegetated tracts of land comprising two to 23 hectares, the method for preventing reproduction had to be permanent and absolute. Capturing the individuals once was going to be difficult enough. Having to recapture them if the need arose because of sterilisation failures was not tenable.

From a medical perspective, control of reproduction is more problematic in females than in males. The procedures that would be effective – tubal ligation (potentially permanent) or ovariectomy (permanent) – require invasion of the abdominal cavity and its attendant risks. Although chemical agents might be effective, there would have been no feasible way of administering them and all those available at that time required repeated application, something which was unworkable in this setting.

Vasectomies, although considered ideal by many people, are not foolproof in controlling reproduction. Re-cannulation of the vas deferens can occur. There may be excision and ligation of distal and proximal ends of the wrong structure. Although this can be minimised by microscopic

1 Emeritus Professor of Veterinary Medicine, University of California; contact: ncbuyukmihci@ucdavis.edu; Copyright © 2026 Nedim C Buyukmihci.

2 [Soulsbury et al 2009-01-01](#)

3 [O'Neill et al 2004-05-01](#)

exam of all removed tissue, this is not always feasible and requires holding the animal captive for the time – at least several days – necessary to process and evaluate the tissue. There are anecdotal reports of ostensibly reliably vasectomised males impregnating females, such as a gibbon at the International Primate Protection League sanctuary⁴ and chimpanzees at Chimp Haven⁵. As I found out later while doing castrations, many of the individuals listed as having been vasectomised previously by experienced veterinarians had healthy-appearing and intact vasa deferentia, despite what were apparently surgical scars consistent with vasectomy. Further, one of the bonnet macaques (*M. radiata*) who had been ‘vasectomised’ by a certified human urologist, impregnated one of the females in his group. When I castrated him, I found that one vas deferens was still intact.

Of considerable concern is that vasectomised animals cannot be differentiated externally from those who are intact or, more problematically, in whom the surgery has failed. As a result, impregnation can occur and the responsible individual or individuals cannot be identified when there is more than one male involved. In such a situation, all males at risk would have to be re-operated, subjecting them to another surgical episode with its attendant risks. In the setting of this sanctuary, the disruptive effect of attempting to capture all the individuals would have been substantial and long lasting. Moreover, re-capture might take more than one breeding cycle so that many females would become impregnated, compounding the problem.

Currently, the only unequivocal means of preventing reproduction in the male is removal of the testicles through castration. Despite its acceptance and wide practice in many other species, it is considered almost anathema in non-human primates. Some people with whom I have communicated – even those trained to care for non-human primates – asserted that castration would be detrimental to social structure and harmful to the animals because they would not engage in copulation or other social activities and would be ostracised. None, however, could offer any evidence, scientific or anecdotal, to support such statements. They also appeared to be ignoring the fact that *any* means of reproductive control will have an effect on social structure because of no new births. Even though copulation may occur with vasectomised individuals, eventually social structure will be changed through lack of progeny. If there was harm simply because of this change, the method of reproductive control could not be at issue.

There appear to be no reports documenting substantive negative effects caused by castration in non-human primates. Sexual behaviour in rhesus monkeys (*M. mulatta*) was influenced by relative dominance before sexual maturity⁶, suggesting that castration, and the resulting decrease in testosterone concentration and other biochemical changes⁷, may have little effect on dominance in general. This also appeared to be the case in free-living baboons (*Papio anubis*) not subjected to castration⁸. In rhesus monkeys, the prenatal concentration of androgens was related to later display of masculine behaviour⁹, suggesting that postnatal reduction in testosterone concentration through castration may not have a major effect on this behaviour. Observations of free-living castrated rhesus macaques at Cayo Santiago revealed considerable individual variation in affectional and other behaviour¹⁰. This appeared to be related to individual variation and familial ties rather than the fact that the individuals were castrated. Although the rhesus monkey skeletal collection at Cayo Santiago showed

4 [Anon 2004-12-01](#)

5 [Allen 2007-01-17](#); [Marder 2012-05-10](#)

6 [Bercovitch et al 1988-10-01](#)

7 [Nagarajan et al 2013-06-01](#)

8 [Sapolsky 1993-01-01](#)

9 [Pomerantz et al 1986-12-01](#), [1988-06-01](#)

10 [Wilson et al 1968-01-01](#)

osteopenia and osteoporosis to be greater in castrated males than in age-matched intact animals¹¹, only five castrated individuals were available for study. Because most of these individuals had a lifespan greater than 26 years, it is difficult to assign any substantive negative implications relative to the effects of castration on bone in that setting.

In long-tailed macaques (*M. fascicularis*), artificially increased concentrations of testosterone resulted in greater aggression¹². Aggression, however, was also mediated by social status and was more frequent between dominant individuals than between subordinate individuals. The data in that study suggest that castration may not change patterns of behaviour already established. In tamarins (*Saguinus fuscicollis*), castration had no effect on certain behaviours, including social and sexual¹³. Although castration resulted in some individuals displaying more submissive behaviour in Javan langurs (*Trachypithecus auratus*), overall group harmony continued¹⁴.

Because I could find no evidence nor elicit any credible information to demonstrate that castration was harmful, I began castrating Japanese macaques in December of 2004. With the animals under dissociative anaesthesia (ketamine), an open technique was used in which an incision was made in the scrotum, the testicles exteriorised and excised after ligating each spermatic cord, and the wound left open to drain. I began with the adult males and then started doing younger individuals as fewer and fewer adults were being trapped. The individuals were largely part of free-living groups in the various open-topped enclosures. Because trapping or otherwise capturing individuals was a laborious and time-consuming process, there was a period of several years during which there was a mixture of intact and castrated adult males. This allowed sanctuary staff to observe the behaviour of this mix of individuals as well as their interaction with adult females and others.

There was no evidence that the castrated individuals suffered or had been compromised with respect to aggression or other negative behaviour directed at them by intact males any more than intact males normally inflict upon each other. There was no evidence that these individuals were subservient simply because of a lack of testicles. During the period when there were intact and castrated adults together, none of the castrated individuals had been ostracised by their peers and no social disruption had occurred. On the contrary, the sterilised males remained in their respective social groups and appeared to have the same social standing they had prior to surgery. Alpha males and their ranking male associates continued in that status.¹⁵ They protected the troop, received and gave attention to others of either gender, and engaged in all the daily activities they did prior to surgery. None of the staff could detect any difference in how they did these things when compared with the way they did them prior to surgery. The peripheral males who were castrated also retained their prior status and behaviour.

Castrated males groomed females and other males and were, in turn, groomed by them. They did not lack female attention as predicted by those opposing castration. They appeared to maintain strong bonds with other males and played and cavorted like youngsters, not detectably differently from the relationship they had as intact males. Many continued to form what appeared to be consorts with females in oestrus, many months after castration when

11 [Kessler et al 2016-01-01](#)

12 [Rejeski et al 1988-02-01](#)

13 [Epple 1978-10-01](#)

14 [Dröscher et al 2012-11-01](#)

15 For example, Buck, the alpha male of his troop, was immediately accepted by his members the day after surgery. His status did not change over the ensuing months and he continued to protect his troop and would take certain youngsters into his arms to 'safety' when he apparently perceived a threat.

testosterone concentration had certainly diminished substantially. Some had strong bonds with particular youngsters and could be seen coddling them, carrying them and removing them from disturbances which they presumably perceived as threatening. One 2-3 year old castrated male escaped from his enclosure into another site where he was immediately accepted by a group of adult and elderly castrated males who lived there. He was protected, carried, groomed and played with by many of these males.

This sanctuary has now had over 12 years of experience with castration involving several hundred individuals, with no observable deleterious effects on the monkeys. Over that period, castration was used on other species, including bonnet and long-tailed macaques, with similar lack of ill-effects.

Although I acknowledge that there may be relatively minor negative effects of castration not revealed during my period of observation, it is highly unlikely that these could overshadow the benefits of reliable sterilisation under the circumstances. My subjective observations have been confirmed objectively by others¹⁶. How reproduction is prevented should be based on what is best for the setting in question. Some settings may allow relatively non-invasive means such as medications or vaccinations. In others, where animals are relatively free-ranging and in which capture is difficult, more reliable, if invasive, methods need to be employed. Contrary to popular opinion among workers in the area of non-human primate rescue, castration appears to cause no apparent ill effects behaviourally or physically in Japanese, bonnet or long-tailed macaques and could be used without reservation when appropriate for the control of reproduction. There is no reason to believe that substantive negative effects would arise in other species of macaques or many other species of non-human primates.

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