

PILOT STUDY OF NON-SURGICAL CASTRATION OF MALE MACAQUES (*Macaca fascicularis*) IN TAMAN TASIK PERDANA (NATIONAL LAKE GARDEN), FEDERAL TERRITORY KUALA LUMPUR

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ABSTRACT. The first pilot study of Non-surgical castration of male long tailed macaque was carried out in the middle of 2010 in Taman Tasik Perdana (National Lake Garden) in Federal Territory Kuala Lumpur. Intraepididymal injections method such as chemical castration was used as one of the fertility control in adult male long tailed macaques. This method does not require removal of the testis, easy to do and inexpensive and mixture of Ethanol-Formalin was used in this technique. Outcome from the male macaque castration programme shows this sterilization technique using a mixture of ethanol and formalin to be very effective in controlling new birth. Castrated male macaque doesn't have any changes in behaviour or physical attributes. These results prove that the breeding of macaques can be reduced.

Keywords: Long tailed macaques, Intraepididymal, azoospermia, chemical castration, Taman Tasik Perdana.

INTRODUCTION

The Department of Wildlife and National Parks (DWNP), Ministry of Natural Resources and Environment is responsible for implementing the conservation of biodiversity in the country. One of the functions of the DWNP is management of wildlife conflicts, particularly involving species such as macaques, elephants, tigers and others. Based on human-wildlife conflict complaints, Long Tailed Macaque (LTM) is the main conflict species.

Human-LTM conflict can be referred to behaviour which causes injury, property destruction and fear on public safety. The main causes of human-LTM conflict were due to competition for food and space between human and wildlife. According to Malaivijitnond and Hamada (2008), LTMs are able to utilize a variety of human habitats and anthropogenic land use change has forced these animals to coexist in human dominated landscapes.

LTMs are naturally found in low elevation habitats, including seashores, swamp and mangrove forests, and river banks. Based on Richard *et al.* (1989),

LTM's unlike other primate species prefer secondary disturbed forests to primary forests. LTM's are commonly seen in recreational parks, temples, monasteries, city and forest parks, and restaurants. Financial losses are incurred when species like LTM cause destruction of personal property (Artois, 1997; Jennifer *et al.*, 2006). The increasing population of this species leads to human-LTM conflict in many countries.

In addressing wildlife conflicts, the Department undertakes a variety of mitigation efforts to address and reduce the amount of complaints from the public that are received daily (2006 Annual Report, Department of Wildlife and National Parks). Fertility control becomes an acceptable method of wildlife population such as long tailed macaque management compared with alternatives such as culling or poisoning (Artois, 1997; Oogjes, 1997; Jennifer *et al.*, 2006).

As ethical considerations and the concept of humane treatment of animals are becoming more prominent in shaping public attitudes toward what is acceptable in terms of controlling animal species, effective contraceptive methods are being sought as a potential solution (Cairns, 2004; Ooges, 1997; Kutzler & Wood, 2006; Jennifer *et al.*, 2006).

Intraepididymal injections method such as chemical castration is one of the non-surgical approaches to male contraception. Chemical agents injected into the epididymis or vas deferens cause infertility by inducing blockage of the tubules in male animals (Bertschinger

et al., 2002; Jochle, 1991; Fayrer *et al.*, 2000; Immegart & Threlfall, 2000)). The technique is not technically challenging, is inexpensive and suitable for large scale sterilization (Pineda & Dooley, 1984). Thus the Department of Wildlife and National Parks (DWNP) chooses this as an additional method in controlling LTM population in Peninsular Malaysia.

This technique is suitable to carry out in recreational parks or tourist places. Large connected forest areas are not suitable for this programme since it will be very difficult for population monitoring. This technique is very easy and can be done by field staff without presence of Veterinarians.

The first pilot study in the field was carried out in the middle of 2010 and Taman Tasik Perdana (National Lake Garden) in Federal Territory Kuala Lumpur was selected as the study area. This paper will explain the success story of our 1st pilot study in evaluating male macaque castration programme.

METHODOLOGY

Study Area

Taman Tasik Perdana (National Lake Garden). This is a large-scale recreational park in Malaysia. The total area of this park is about 91.6 hectares. It is located in the heart of the city and established in 1888. It contains large manicured gardens and a host of attractions (Figure 1).

Identifying groups and individuals

Long tailed macaque census was carried out in the study area to identify number of macaque groups and number of individuals based on age category in each group. There were two groups at this location. One group was often roaming around the Orchid Garden, Kuala Lumpur Bird Park parking area, and Tun Abdul Razak Memorial. This group was named as '*Ekor Kontot*' or stubby tail as group identification. Another was roaming in Tangling road and National Space Centre. This group was designated as Tangling group.

Chemical Vasectomy

The alpha male and 2 sub adult males from '*Ekor Kontot*' were sterilized using chemical vasectomy and the alpha male from Tangling group was sterilized (Figure 2). Castrated males were tagged with red coloured collar and implanted with microchip (Figure 3).

Monitoring

Monitoring of castrated macaques was the important part in this programme. Only through monitoring we will be able to justify the effectiveness of this study. Monitoring was carried out fortnightly focusing on five main parameters such as bellow:

- mating
- habits
- aggressiveness
- fighting
- searching for food
- activeness

Data recording sheet was provided to committed group from Federal Territory Kuala Lumpur to be filled up during monitoring. Monthly report with monitoring data was prepared by head of committed group.

The castrated alpha male from *Ekor Kontot* (Figure 4) was head of the group until 2013. The two castrated sub adults were shot dead in 2011 because of causing major property destruction in KL Bird Park. The Tangling group was dominated by the castrated male too. In 2011 the group migrated to National monument; across the road. Monitoring of this group was very difficult and challenging. Finally in middle of 2013 the alpha male with few more individuals were shot down because of threat to tourists.

RESULTS AND DISCUSSION

Monitoring on five parameters was tabulated in Table 1. Castrated male macaque doesn't have any changes in behavior or physical attributes. Outcome from the male macaque castration programme shows this sterilization technique using a mixture of ethanol and formalin can be very effective in controlling new birth. These results prove that the breeding population of macaques can be control.

Macaque castration technique was initiated by researchers from Agriculture, Fisheries and Conservation Department (AFCD) and Ocean Park Conservation Foundation (OPCF) Hong Kong. They are actively conducting sterilization programme for male and female rhesus monkey. Endoscopic tubectomy is

sterilization method for females while chemical vasectomy for males.

In year 2009, the Department decided to implement similar male macaque castration programme in Peninsular Malaysia. In-house validation of chemical castration with mixture of Ethanol-Formalin injections method was evaluated on 34 macaque specimens. Thirty specimens showed absence of spermatozoa in semen sample. Sexual drive remained intact and no signs of discomfort were observed following injection. One of the challenges in this technique is that the juvenile macaque’s epididymis is small and difficult to locate (Karuppanan *et al.*, 2013).

Therefore DWNP decided to castrate adult macaques to avoid mistakes during handling the specimens. The low cost, ease of use, and cultural acceptance of a castration technique that does not require removal of the testis make ethanol-

formalin castration a valuable option for large-scale use, particularly in controlling LTM population and reducing human-macaque conflicts in Peninsular Malaysia.

There are advantages and challenges in this male sterilization programme. The advantages are this approach doesn’t involve high cost. This technique also can be done by our supporting staffs like rangers without presence of veterinarians. However, all the non-suitable male macaques should be eliminated by trapping or shooting.

Because these macaques are capable to breed and increase number of individuals, the key challenge in achieving this objective is difficulty to trap or shoot these non-suitable macaques. Shooting often cannot be performed at all study locations since it is a tourist site. Trapping often fails as macaque feeding activities are very high and popular among tourists in these study locations.

Table 1. Monitoring on castrated macaques

Monitoring of castrated macaques in Taman Tasik Perdana, Kuala Lumpur June 2010 - June 2013		
Behavior (Parameter)	<i>Alfa Ekor Kontot</i>	<i>Alfa Tangling Group</i>
Aggressiveness	√	√
Mating habits	X	X
Fighting	√	√
Searching for food	√	√
Activeness	√	√



Figure 1. Study area in Taman Tasik Perdana, Kuala Lumpur.



Figure 3. Red collar as ID



Figure 2. Intraepididymal injection on male macaque specimen



Figure 4. Alfa male macaque from *Ekor Kontot* group

CONCLUSION

These chemical castration methods were extended to other states. A total of 9 states and 11 locations have been engaged in this long tailed macaque sterilization program since 2011.

Results of the nine states showed that macaque sterilization technique using a mixture of ethanol and formalin was successful in new birth control.

The monitoring results also show that sterilized macaque behavior has not changed and active like other normal

macaques.

This programme is suitable to be used as an alternative technique for culling of long tailed macaque. Outcome of the programme is very important to human-long tailed macaque conflict management by DWNP, Peninsular Malaysia.

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