

UNIVERSITI PUTRA MALAYSIA

***THE EFFECTS OF LIDOCAINE-BUPIVACAINE BLOCK IN CATS
UNDERGOING CASTRATION***

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TITLE

THE EFFECTS OF LIDOCAINE-BUPIVACAINE BLOCK IN CATS UNDERGOING CASTRATION



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A project submitted to the
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CERTIFICATION

It is hereby certified that we have read this project paper entitled “The effects of lidocaine-bupivacaine block in cats undergoing castration” by Ng Tuck Cheok and in our opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfillment of the requirement for the course VPD 4901-Project.

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DEDICATION

This thesis is for my mother, brothers, and sisters. The greatest gift they could give is the gift of unconditional love.



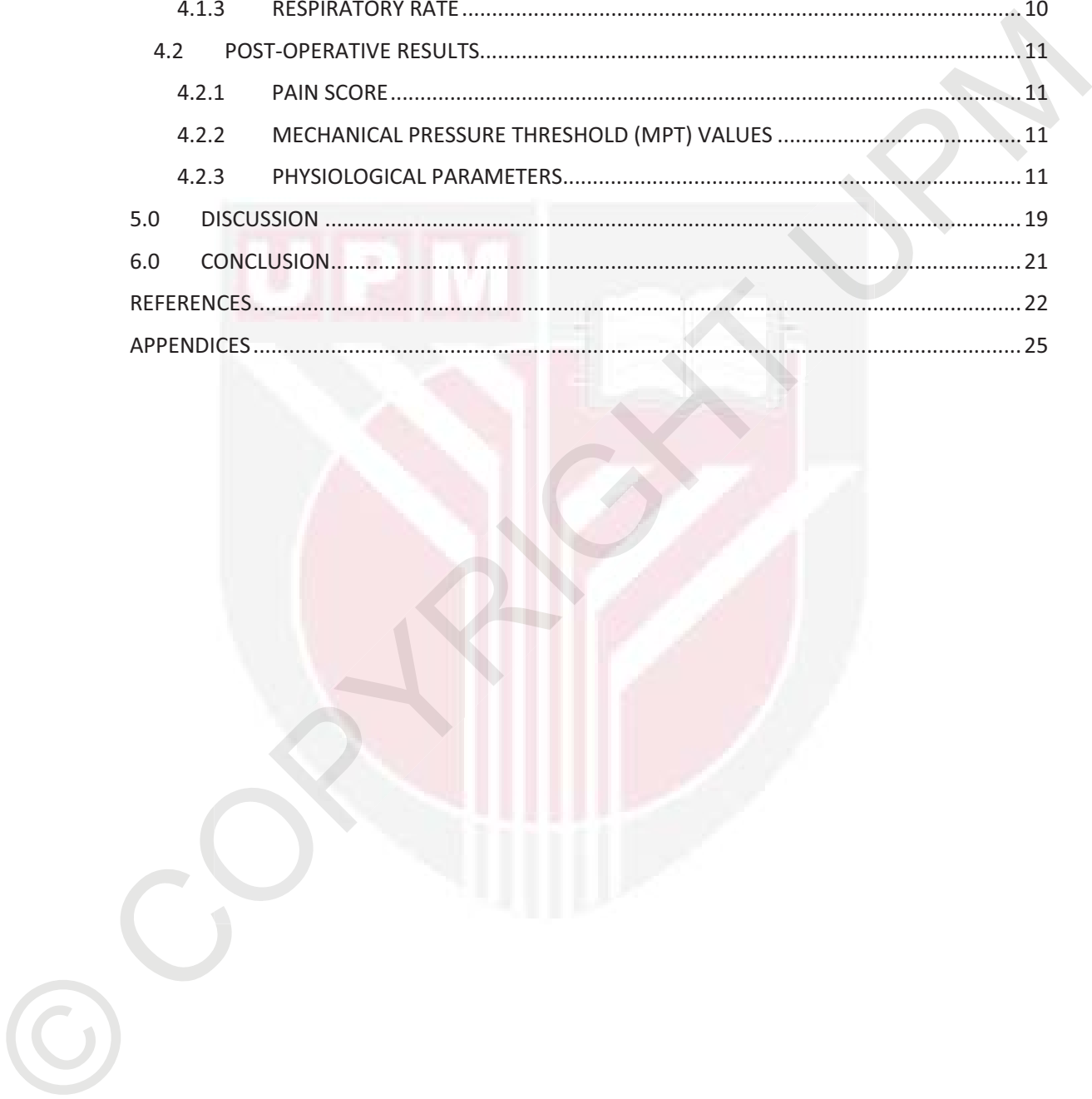
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ABSTRAK

Abstrak daripada kertas projek yang dikemukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada keperluan kursus VPD 4999- Projek

Kesan Penggunaan Blok Lidocaine-Bupivacaine Pada Kucing Yang Dikasi

Oleh

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2015

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Kesan sekatan lidocaine-bupivacaine pada kucing yang menjalani rutin pengasian telah ditentukan. Dua belas kucing telah dibahagikan secara rawak kepada dua kumpulan. Kucing dalam Kumpulan 1 (Sekatan setempat, n = 6) , telah diberi campuran 1 mg/kg 2% lidocaine dan 1 mg/kg 0.5 % bupivacaine secara subkutaneus ke dalam pundi skrotum. Kucing dalam Kumpulan 2 (Kawalan, n = 6) tidak menerima sekatan setempat. Kedua-dua kumpulan dibius dengan ketamine-acepromazine intraotot, pada 15 mg/kg dan 0.1 mg/kg masing-masing dan dikekalkan dengan sevoflurane melalui topeng muka. Tekanan darah arteri sistolik (SAP), diastolik (DAP), dan purata (MAP), kadar jantung (HR), dan kadar pernafasan (RR) dipantau sepanjang pembedahan. Selepas pembedahan, semua kucing diberi meloxicam, 0.2 mg/kg secara subkutaneus. Skor kesakitan diperolehi pada 4, 8, dan 24 jam selepas pembedahan.

Nilai-nilai ambang tekanan mekanikal (MPT) diambil pada 2 , 4 , 8 , dan 24 jam selepas pembedahan. Semasa pembedahan, SAP, DAP, MAP, dan HR cenderung untuk menjadi lebih tinggi dalam kumpulan kawalan. Peningkatan dalam kadar jantung memuncak semasa tarikan dan autoligasi kord sperma. Tiada perbezaan rawatan dalam RR. Selepas pembedahan, skor kesakitan dalam kumpulan sekatan setempat adalah lebih rendah daripada kumpulan kawalan pada 4 jam selepas pembedahan. Tiada perbezaan rawatan dalam HR, RR, SAP, DAP, MAP, dan nilai-nilai MPT. Kesimpulannya, penyusupan subkutaneus lidocaine-bupivacaine ke dalam pundi skrotum sebelum pengasian memberi kestabilan hemodinamik intrabedah yang baik dan analgesia yang lebih baik selama 4 jam selepas pengasian.

Kata Kunci: *kucing, pengasian, sekatan setempat, lidocaine-bupivacaine, hemodinamik*



ABSTRACT

An abstract of the project paper presented to the Faculty of Veterinary Medicine in partial fulfilment of the course VPD 4999- Project

The Effects of Lidocaine-Bupivacaine Block in Cats Undergoing Castration

By

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Supervisor: Dr. Chen Hui Cheng

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The effects of lidocaine-bupivacaine block in cats undergoing routine castration were determined in this controlled, randomized, and blinded study. Twelve cats were randomly assigned to two groups. Cats in Group 1 (Local block, n=6), were given a mixture of 1 mg/kg of 2% lidocaine and 1 mg/kg of 0.5% bupivacaine subcutaneously at the scrotal sac. Cats in Group 2 (Control, n=6) did not receive the local block. Both groups were induced with ketamine-acepromazine intramuscularly, at 15 mg/kg and 0.1 mg/kg respectively, and maintained on sevoflurane via facemask. The systolic (SAP), diastolic (DAP), and mean arterial blood pressure (MAP), heart (HR), and respiratory rate (RR) was measured intra-operatively at specific events. Postoperatively, all cats received meloxicam, 0.2 mg/kg subcutaneously. Pain scores were determined at 4, 8, and 24 hours post-operatively. The mechanical pressure threshold (MPT) values were determined at 2, 4, 8, and 24 hours post-operatively. Intra-operatively, the SAP,

DAP, MAP, and HR tended to be higher in the control group. The hemodynamics peaked during traction and autoligation of the first spermatic cord in the control group. There was no treatment difference in RR. Post-operatively, pain scores in the group given local block were lower than the control group at 4 hours post-operation. There is no treatment difference in post-operative HR, RR, SAP, DAP, MAP, and MPT values. Thus, it can be concluded that subcutaneous infiltration of lidocaine-bupivacaine into the scrotal sac before castration improved intra-operative hemodynamic stability, and provided better analgesia up to 4 hours post-castration.

Keywords: *cat, castration, local block, lidocaine-bupivacaine, hemodynamic*

1.0 INTRODUCTION

Castration in male cats under general anaesthesia is frequently performed in veterinary practice. This procedure is assumed to be a mild to moderately painful procedure to warrant the use of peri-operative analgesia (Mathews, 2000). However, there has been limited use of peri-operative analgesia during castration, especially in cats (Hewson *et al.*, 2006). This is because peri-operative pain is often under-estimated in cats (Wright, 2002). Some of the difficulty lies in assessing whether the cat is experiencing pain, as cats usually hide signs of pain.

Intra-operative nociception will stimulate the sympatho-adrenal system, resulting in increased heart rates, blood pressures, and respiratory rates. The commonly used markers of intra-operative nociception are the heart rate and blood pressure (Moldal *et al.*, 2013). The intra-operative condition of the patient should be closely monitored, as significant increase in hemodynamics may indicate inadequate anaesthesia or analgesia.

A certain degree of pain may be experienced by the cat after surgery, although the cat may appear fine. A study done by Smith *et al.* (1996) showed that cats that did not receive analgesics had higher cortisol concentration than cats that receive analgesic after surgery. Pain may increase the potential for secondary problems such as immune suppression, secondary illness, and prolong hospital stay. Mathew (2000) also hypothesized that if acute pain were better controlled, the chronic pain will not develop. This shows the importance of analgesia given peri-operatively.

Local anaesthetic agents can be incorporated into routine castration procedure because of its intra-operative anti-nociceptive effects during castration in other veterinary species. This stability that is produced may reduce the anaesthetic agent used during surgery,

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