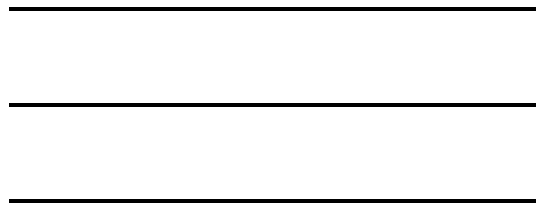


2001 6



	.....	1
I.	.....	3
1.	.....	3
가. Guarding reflex	.....	4
(1) Guarding reflex	.....	4
(2) Guarding reflex	.....	5
2. 가	.....	6
II.	.....	8
1.	.....	8
2.	.....	8
3.	.....	10
III.	.....	11
IV.	.....	14
V.	.....	17
	.....	18
	.....	21

Fig. 1.5

Fig. 2.9

Fig. 3.12

Fig. 4.

.....13

Fig. 5.13

:
(guarding reflex)

가
on - off mechanism

reflex guarding

: 12 ,
transmission) á - chloralose (neural

60ml/hr double lumen

: 12 4
11,
13, 6, 30 ml , 23, 30, 43, 38
cmH₂O
17, 24, 18, 45 ml ,
62, 68, 22, 40 cmH₂O . ,

: guarding reflex

inhibition) (pudendal nerve mediated bladder , 가 .

: guarding reflex, ,

< >

I.

1.

가

가

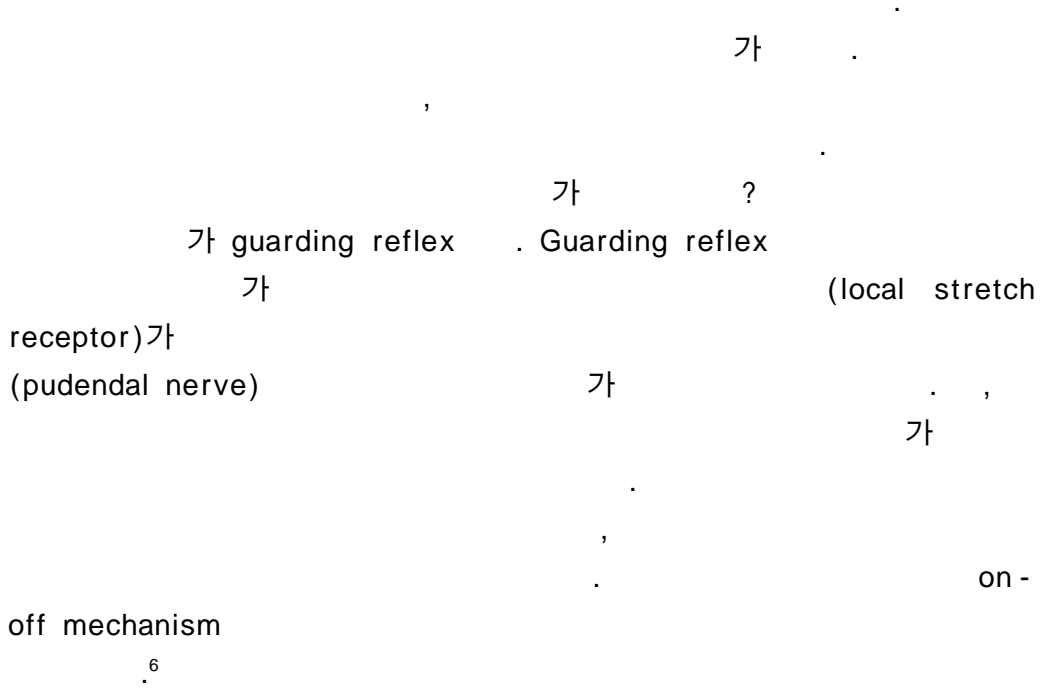
가

1-5

가

가

가. Guarding reflex



(1) Guarding reflex

(Fig. 1).^{6,7}

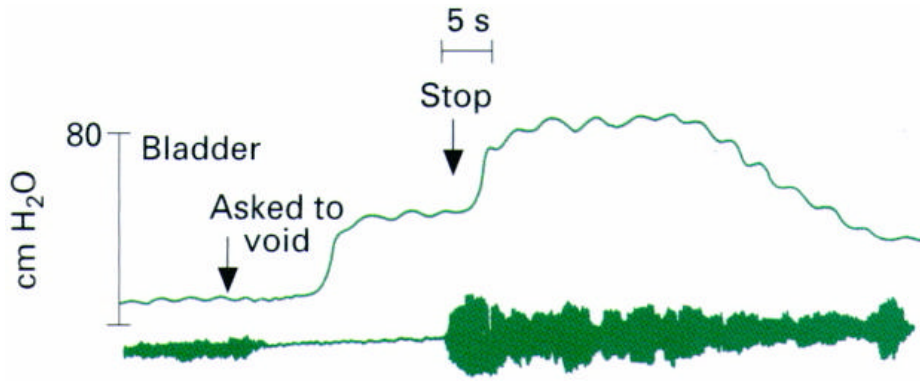


Fig. 1.

EMG가

가

(From Park: Br J Urol, 1997).

가

8-9

(uninhibited bladder contraction)

gurdling reflex 가

^{10,11}

가가

(2) Guarding reflex
 , guarding reflex

guarding reflex

Barrington¹³

¹²

¹⁴

, guarding reflex

fast twitch fiber

60 - 70

¹⁵

, guarding reflex

guarding reflex

¹

¹⁶

2. 가

가

fast

twitch fiber

가

가

Shafik¹⁵

lidocaine

가

가

가

가

II.

1.

가 2.5 - 6.5 kg

12

National Academy of Sciences(NAS)
ILAR(Institute of Laboratory Animal Research) 'guide for the care and
use of laboratory animals'

Laboratory Animal Manual 99 - 00 version¹⁷

ketamine HCl (Ketaset®, 15mg/kg, i.m.)

, 0.7 - 1% halothane - N₂O

가

6Fr. double lumen

purse string suture

heat lamp

37 - 38°C

cephalic vein

5% dextrose

halothane - N₂O

α - chloralose(Sigma Chemical,
St Louis, MO, USA; initial dose, 40 - 50mg/kg i.v.)

α - chloralose(5mg/kg, i.v.) 가

2.

Biopac(Biopac System, Santa Barbara, CA,

USA)

double lumen

60ml/hr

가

(Fig. 2).

20 cmH₂O

가

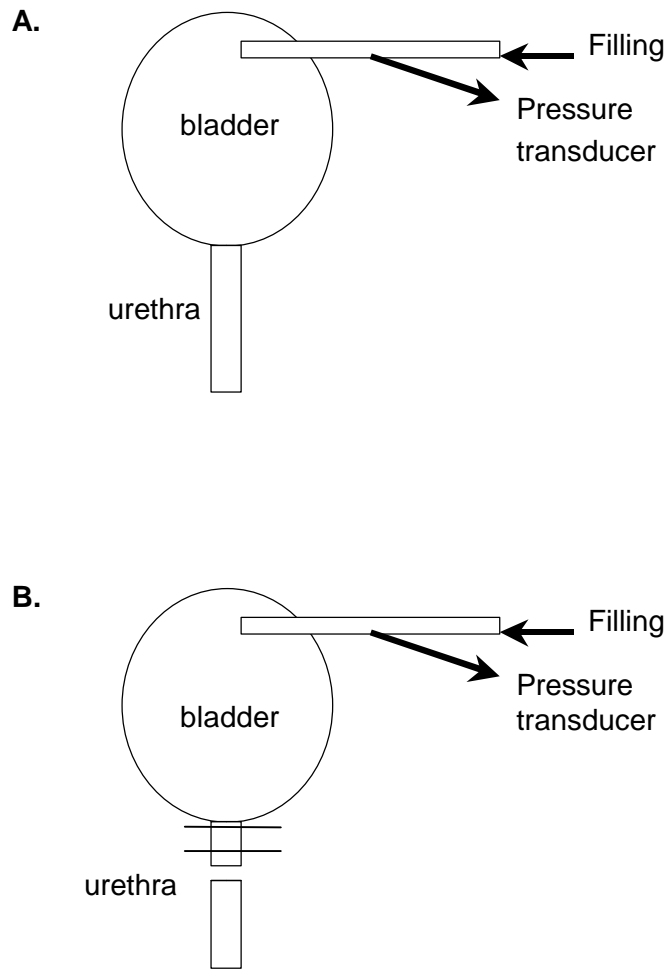


Fig. 2.

A.

B.

3.

paired t - test
가

, p 0.05
.

,

III.

12 4
8
4
11, 13,
6, 30 ml 23, 30, 43, 38
cmH₂O (Fig. 3A).
17, 24, 18, 45 ml
62, 68, 22, 40 cmH₂O (Fig. 3B).
15±5ml
26±7ml
(p<0.05; Fig. 4).
34±4, 48±11 cmH₂O
(p>0.05; Fig. 5).

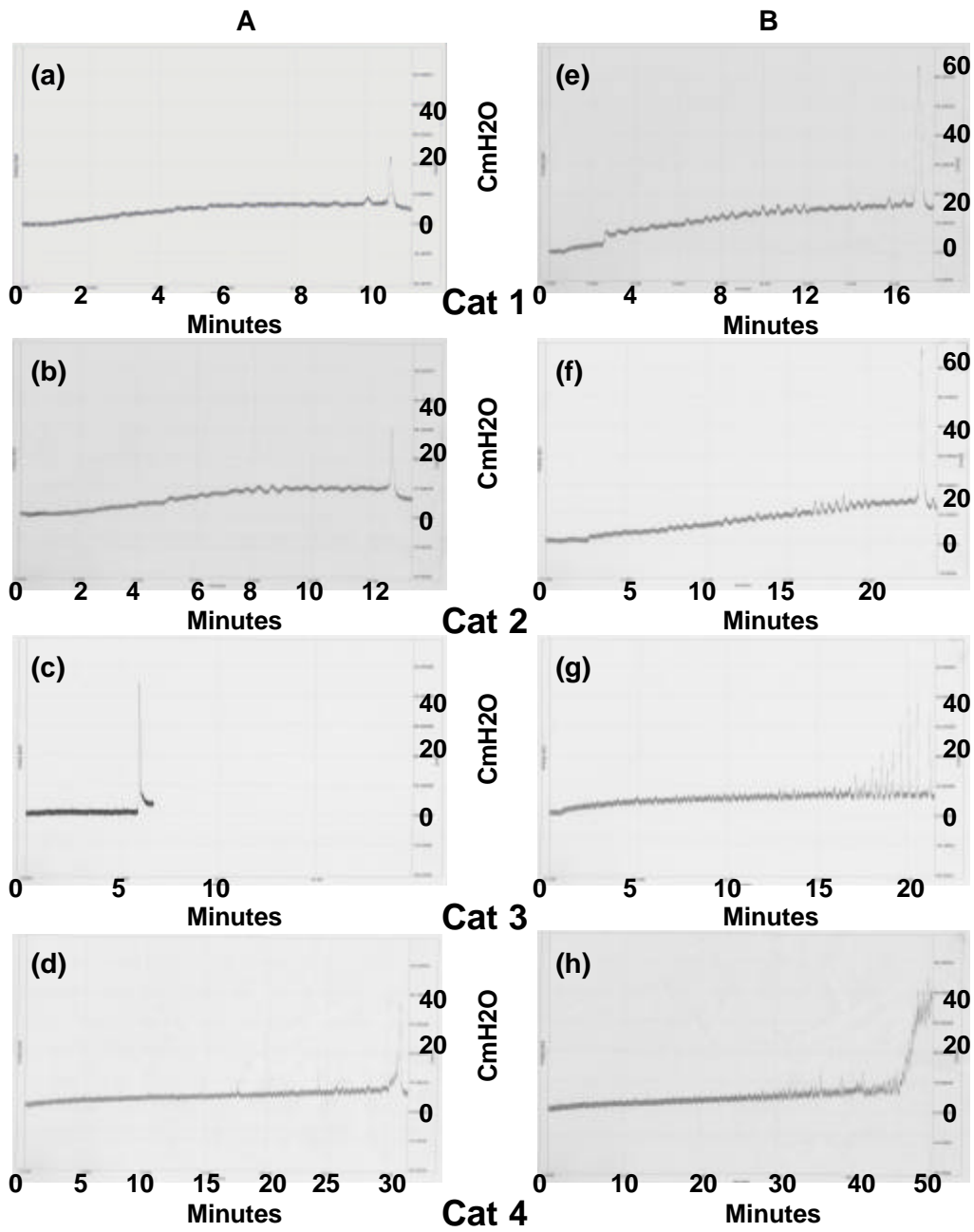


Fig. 3.

. A. 4

60ml/hr
 cystometry (a - d) B.
 cystometry (e - h)

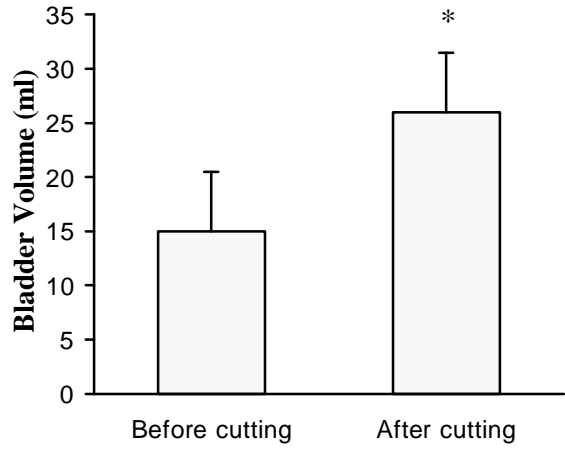


Fig. 4.

가 (* p<0.05, paired t - test).

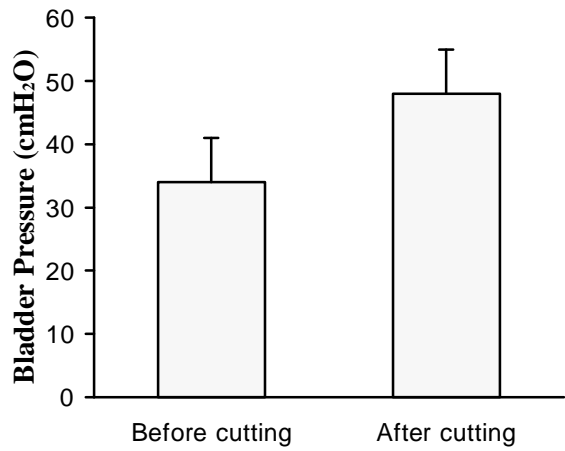


Fig. 5.

(p>0.05, paired t - test).

IV.

가

.¹⁸

가

. Guarding reflex

가

2 - 4

lateral

spinothalamic tract

가 subcortical micturition center

가

.¹⁹

, á - chloralose

가

guarding reflex

- chloralose

.²⁰

chloralose

guarding reflex

Guarding reflex

가

.^{12,21} Shafik¹⁵

Kiruluta ²²

. Guarding reflex

가

guarding reflex가

.⁶

guarding reflex

가

가

.¹⁵

reflex

guarding

가 , guarding reflex

. Kiruluta ²²

가

Kiruluta ²²

guarding reflex

가

2

V.

,

guarding reflex

가

가

guarding reflex

가

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Abstract

The change of the micturition mechanism after cutting proximal urethra in the cat

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Introduction: Recently many reports have explained the normal micturition mechanism as the contraction and relaxation of external urethral sphincter (guarding reflex). Despite most of the neural circuits involved in controlling lower urinary tract function being autonomic, micturition and storage are under precise volitional control. For this reason many reports have proposed a hypothesis that a physiological on-off switch for bladder activity is at the external urethral sphincter. We think that knowing the mechanism of a progressive and involuntary increase in intraurethral pressure during bladder filling helps to understand the urinary continence mechanism. We made a comparison between the cystometry before cutting proximal urethra and after cutting, and we tried to propose the mechanism of urinary continence during bladder filling.

Materials and Methods: Experiments were performed on 12 male cats weighing 2.5 to 6.5kg. Alpha chloralose anesthesia (40-50mg/kg) was maintained after induction with ketamine. The effectiveness of the anesthesia was assessed by the corneal reflex and pulse rate. To perform urodynamic measurement, the bladder and proximal urethra were exposed through a midline abdominal incision. To prevent the bladder from filling with urine, both

ureters were tied distally and cut, and the proximal ends were drained externally. A double lumen catheter was inserted through the bladder dome, and used to fill or drain the bladder and monitor intravesical pressure.

Results: Of the 12 male cats, 4 showed normal bladder contraction during bladder filling. Normal detrusor contraction during bladder filling before cutting of the proximal urethra was noticed in the 11, 13, 6 and 30 ml bladder filling. Detrusor contraction during bladder filling after cutting and ligation of the proximal urethra was noticed in the 23, 30, 43 and 38 ml bladder filling, respectively. Detrusor contraction during bladder filling was delayed after cutting and ligation of the proximal urethra.

Conclusion: The inhibitory mechanism of detrusor contraction (guarding reflex) during bladder filling persisted and was reinforced after the proximal urethra was cut and ligated. Consequently, we suppose that the proximal urethra plays an important role in the guarding reflex .

Key Words: guarding reflex, external urethral sphincter, proximal urethra, continence