

# Harmonic Scalpel®

## The Usefulness of a Harmonic Scalpel® for Hemorrhoidectomy

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**Purpose:** The aim of this study was to compare conventional scissors and Harmonic Scalpel® hemorrhoidectomy.

**Methods:** Two hundred and five patients were prospectively assigned to two groups in the consecutive order group was divided into Group A (Harmonic Scalpel® excision; n=101) and Group B (conventional scissor excision; n=104). All other aspects of surgery and anesthesia standardized. Intramuscular opiate was available on during the postoperative period, and analgesic requirements were also recorded. All patients noted their pain on basis using a visual analogue scale (0=no pain; 10 pain). The length of hospitalization, operative postoperative complications were also analyzed.

**Results:** The operative time was 16.6±0.9 minutes 20.8 minutes in Group A and B, respectively (p<0.05). Length of hospital stay was 4.1±0.1 and 4.5±0.1 day (p<0.05). Pain scores in the group A were significantly less than in the group B (p<0.01). Analgesic requirements also significantly less in group A (p<0.05). Postoperative complications, such as urinary retention, fecal impaction, skin tags were rarer in group A. One patient in group A and two patients in group B developed secondary hemorrhage, but no patient had anal stricture.

**Conclusions:** The Harmonic Scalpel® excision significantly shortens the operative time for hemorrhoidectomy, less blood loss and postoperative pain without reoperation, early or late postoperative complications. **J Korean Coloproctol 2002;18:10-14**

**Key Words:** Hemorrhoidectomy, Harmonic Scalpel®, Postoperative pain, Bleeding

2500 가

가

가 3 4

가

(electrocautery), CO<sub>2</sub> Nd:YAG (circular stapled hemorrhoidectomy)

4,11

Harmonic Scalpel® (Ethicon Endo-Surgery, Cincinnati, OH, USA)

가

Amaral<sup>12</sup>

13,14

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( : 480-011)

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2001 , 205 Harmonic

Scalpel<sup>®</sup> 가  
 1) 2000 3 2000 5 3  
 Harmonic Scalpel<sup>®</sup> (A )  
 가 (B )  
 , A 101 ( 47 ), 41.0 (17 76) , B 104 ( 55 ) 37.6 (19 65)  
 , Goligher (Table 1).

2) , 0.5% bupivacaine 1.0 ml , prone jack-knife  
 2-0 chromic catgut , B (

**Table 1.** Hemorrhoidectomy-Harmonic Scalpel<sup>®</sup> (group A) vs. conventional scissors (group B)

	Group A	Group B
No. of patients	101	104
Male/female*	47/54	55/49
Age*	40.8±1.2 (17 76)	36.6±1.0 (19 65)
Grade of hemorrhoids (2/3/4)*	12/75/14	10/83/11
No. of excision*	2.9±1.2	3.9±0.2

\*not significant.

2 : Harmonic Scalpel<sup>®</sup>  
 ) 1 : 100,000  
 5 ml ,  
 A ,  
 Harmonic Scalpel<sup>®</sup>  
 가  
 loxopropfen sodium (Loxfen<sup>®</sup>) ,가  
 ,  
 가  
 meperidine hydrochloride (Demerol) 50 mg  
 ,  
 magnesium oxide (Magmil<sup>®</sup>) (Mutacil<sup>®</sup>) ,  
 ,  
 가 6 가  
 .  
 3) 가  
 , ,  
 .  
 1, 2, 3, 7, 14, 21, 28  
 , VAS (Visual Analogue Scale)  
 0,  
 가 10 가  
 3  
 meperidine hydrochloride (Demerol)  
 loxopropfen sodium (Loxfen<sup>®</sup>)

**Table 2.** Operative time, hospital stay and wound healing time

	Group A	Group B
Operative time (min)*	16.6±0.9	25.3±0.8
Hospital stay (days) <sup>†</sup>	4.1±0.1	4.5±0.1
Wound healing time (days) <sup>†</sup>	21.8±1.5	29.2±1.8

\*P < 0.01; <sup>†</sup> P < 0.05.

**Table 3.** Pain scores for group A and group B

	Days after operation							
	0*	1*	2*	3*	7*	14*	21*	28 <sup>†</sup>
Group A	4.6±0.1	3.7±0.2	3.2±0.2	3.6±0.2	1.8±0.1	1.0±0.1	0.4±0.1	0.2±0.1
Group B	5.8±0.2	4.8±0.2	4.3±0.2	4.9±0.2	3.8±0.2	2.3±0.2	0.9±0.1	0.2±0.0

\*P<0.01; † not significant.

**Table 4.** Analgesic requirements after Harmonic Scalpel<sup>®</sup> and conventional hemorrhoidectomy

	Demerol (50 mg/ample)*	Loxoprofen (68.1 mg/tablet)*
Group A	1.0±0.1 (Ample)	4.4±0.3 (Tablet)
Group B	1.5±0.2 (Ample)	5.7±0.5 (Tablet)

\*P<0.05

**Table 5.** Postoperative complications

	Group A (n=101)	Group B (n=104)
Urinary retention	4	12
Early bleeding	0	3
Late bleeding	1	2
Fecal impaction	0	9
Skin tag	3	6
Postop. fissure	2	3
Abscess	1	0

3). A (P<0.05)(Table 4).

Unpaired student's t-test<sup>2</sup>  
test ±  
, P 0.05

1 3)  
B 29.2±1.8 A 21.8±  
1.5 (P<0.05)(Table 2).

4)  
A B 가 4  
1) (4.0%) 12 (12.5%), fecal impaction B 9  
가 . B 3 가 ,  
A 1 , B 2 가 .  
A B  
A 16.6±0.9 ,  
B 25.3±0.8 A  
, A (P<0.01).  
A 4.1±0.1 , B 4.5±0.1  
, (P<0.05)(Table 2).

2)  
A B , 1, 2, 3, 7, 14,  
21, 27 visual analogue scale  
, 27 A 가  
(P<0.01)(Table

2)  
A B , 1, 2, 3, 7, 14,  
21, 27 visual analogue scale  
, 27 A 가  
(P<0.01)(Table

4)  
A B 가 4  
1) (4.0%) 12 (12.5%), fecal impaction B 9  
가 . B 3 가 ,  
A 1 , B 2 가 .  
A B  
A 16.6±0.9 ,  
B 25.3±0.8 A  
, A (P<0.01).  
A 4.1±0.1 , B 4.5±0.1  
, (P<0.05)(Table 2).

가

가

(Treitz' muscle)

가

가 가

Kusunoki<sup>18</sup> Harmonic Scalpel®

forceps coagulation technique (FCT)

, FCT

(heat generation)

(carbonization)가

, Harmonic Scalpel®

Harmonic Scalpel®

Harmonic Scalpel®

(lateral thermal injury)

가

가 가

(seroma),

, Armstrong<sup>19</sup>

Harmonic Scalpel®

50

Harmonic Scalpel®

(tissue dissection)

가

Harmonic Scalpel®

가 hand piece

(transducer)

hand piece

blade

Blade가

, 55,000 , 60 100 μm

(hydrogen bond)

, 50

100°C

coagulum

가

blunt mode

5 mm

, 3 mm

<sup>17</sup>

Harmonic Scalpel®

<sup>17</sup> Blade tip

가

Harmonic Scalpel®

, Armstrong

(intracellular fluid) 가

가 가

tissue plane

Harmonic Scalpel®

tissue plane

(cavitation effect),

vascular plane

<sup>17</sup>

24

Harmonic Scalpel®

blade tissue pad

1

Scalpel<sup>®</sup> Harmonic

Matsuda<sup>20</sup> Harmonic Scalpel<sup>®</sup>

1.8%

가 가 가 가

Harmonic Scalpel<sup>®</sup>

Harmonic Scalpel<sup>®</sup>

Harmonic Scalpel<sup>®</sup> 가 , Har-

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