Effectiveness of Ginger for Prevention of Nausea and Vomiting after Gynecological Laparoscopy

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Objective: *To study the effectiveness of ginger for prevention of nausea and vomiting after gynecological laparoscopy.*

Material and Method: *From July 2005 to October 2005, 60 inpatients who underwent laparoscopic operations for non-cancer gynecologic conditions at Bangkok Metropolitan Administration Medical College or Vajira Hospital were randomized into Group A (n = 30) or Group B (n = 30). Group A received 3 capsules of ginger (1 capsule contained 0.5 g of ginger powder) while Group B received 3 capsules of placebo. Both groups received their medicine 1 hour prior the operation. Nausea and vomiting were assessed with the Visual Analogue Scores (VAS) and presence of vomiting at 2 and 6 hours after the operation.*

Results: *Median VAS at 2 hours post operation of Group A was not significantly different from that of Group B with the median of 0 (range, 0-5.4) and 0.15(range, 0-10) respectively (95%CI from -2.59 to 0.90 and p = 0.142). At 6 hours post operation, the median VAS of Group A was significantly lower than group B, 0.55(range, 0-7.4) versus 2.80(range,0-10) (95%CI from -3.61 to -0.73 and p = 0.015). Presence of vomiting at 2 hours was not different between the two groups, 10% in Group A and 20% in Group B (95%CI from -28% to 8% and p = 0.278). At 6 hours, 23.3% of group A had an episode of vomiting compared to 46.7% of group B (95%CI from -47% to 1% and p = 0.058).*

Conclusion: *Ginger has shown efficacy for prevention of nausea and borderline significance to prevention vomiting after gynecological laparoscopy at 6 hour post operation.*

Keywords: *Ginger, Nausea, Vomiting, Gynecological laparoscopy*

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Nausea and vomiting are common complications after laparoscopic surgery with the incidence ranging from 25-40%[1-3]. The symptoms usually occur during the first 4 to 6 hours post operation period and rarely lasts longer than 24 hours[4]. Although most patients developed only minimal symptoms, some might experience severe symptoms that can cause serious complications such as electrolyte imbalance, dehydration, gastric content aspiration, prolonged recovery time, prolonged hospitalization, and bad impression to the subsequent surgery[5]. Effective prevention of post operative nausea and vomiting certainly leads to less undesirable sequelae and probably a better outcome of treatment.

Recently, many evidences have been emerging that ginger (Zingiber officinale Roscoe), a local medicinal herb, has significant antiemetic effect[3,6-8]. The action of ginger has direct effects on the gastrointestinal tract[9-11]. An active ingredient of ginger is 6-gingerol, which is responsible for the aromatic, spasmolytic, carminative and absorbent properties of ginger[9,10]. Ginger is a traditional herb that is inexpensive, does not have serious adverse effects[9,10,12-16] and has no CNS (extrapyramidal) side effects[9-11]. Many studies reported the antiemetic effect of ginger in many circumstances such as morning sickness[17], motion sickness[18], nausea and vomiting after chemotherapy[19], and post operatively[3,6-8]. However, the effects of gin-

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ger in cases of postoperative gynecological laparoscopy are controversial. A dose of 1 gm has been used in a previous study. Some studies showed effectiveness of ginger 1 gm in outpatient gynecological laparoscopy cases[3,8], however other studies reported negative results[20-22]. Therefore, the objective of the present study was to study the effectiveness of ginger in a larger dose (1.5 gm) for prevention of nausea and vomiting after gynecological laparoscopy.

Material and Method

From July 2005 to October 2005, 60 patients who were admitted for elective non-cancer gynecological laparoscopy were included in the present study. The present study was conducted after approval from the Ethics Committee of the institution. All patients gave their written informed consent before entering the present study. The patients were included if they could speak and read Thai and were able to swallow drug capsules. The patients were excluded if their ages were below 18, pregnant, had underlying gastrointestinal or hepatic diseases, received antiemetic drug or any medications that might have side effects of nausea or vomiting within 24 hours before surgery, or had a history of ginger allergy. Patients who would undergo laparoscopic hysterectomy were also excluded. All patients included in the present study were randomized by blocks of four into Group A (n = 30) or Group B (n = 30). Group A received ginger 1.5 gm (three capsules of 0.5 gm ginger powder); Group B received three capsules of placebo that looked the same as the ginger capsule. Patients were instructed to score their nausea symptom according to the Visual Analogue nausea Score (VAS), and they were assessed for vomiting, a side effect of the drug, by a physician at 2 and 6 hours after surgery. Nausea is defined as discomfort symptom at pharyngeal or upper gastric area that might lead to vomiting, and was subjective[5]. VAS of nausea was recorded on a 10 cm linear analogue scale that ranged from 0 (no nausea at all) to 10 (the worst nausea). Vomiting is defined as severe gastrointestinal motility that caused a projection of gastrointestinal content from the oral route[5]. Presence of vomiting was regarded when gastric content was present.

Ginger or placebo capsules were swallowed with 30 ml water at 1 hour before starting the operation. Similar anesthetic technique and agents were provided in both groups. Intraperitoneal CO_2 pressure was controlled at 15 mmHg and was released when the operation was finished. Intraoperative use of opioid was administered upon the anesthesiologist's decision. Post operative analgesic was given upon the patient's requirement. Antiemetic drug (Metoclopramide) was given when more than 2 episodes of vomiting occurred.

Data recorded included: age, body weight, occupation, drug allergic history, prior intake medication within 24 hours preoperation, past history of illness, history of post operative nausea vomiting, type and duration of surgery, the use of opioid during surgery, the requirements of postoperative analgesia and antiemetic drug. The VAS, episode of vomiting and side effect of ginger such as itching, abdominal pain, heartburn, respiratory discomfort, insomnia were also recorded at 2 and 6 hours post operation.

Data were analyzed using SPSS statistical software version 11.5 (SPSS, Chicago, IL). Descriptive statistics were used for demographic data and summarized as mean with Standard Deviation (SD), median with range, or frequency with percentage. The Mann-Whitney U test was used to compare continuous variable. The Chi- square test was used to compare categorical data between the two groups. The outcomes were significant if $p < 0.05$.

Results

Sixty patients were included in the present study. Demographic data were similar in both groups in terms of age, weight, occupation, past history of illness, history of post operative nausea vomiting, type and duration of surgery. The use of opioid during surgery and post operative periods (within 2 hour and at 2-6 hours) revealed no statistical significant difference between both groups (Table 1).

At 2 hours post operation, median VAS in the ginger group was 0 (range, 0-5.4) and in the placebo group it was 0.15 (range, 0-10) (Table2). Vomiting was found in 10% of the ginger group and 20% in the placebo group (Table 3). There were no statistical significant differences in both nausea ($p = 0.142$, 95%CI from -2.59 to 0.90) and vomiting ($p = 0.278$, 95%CI from -28% to 8%).

At 6 hours postoperatively, median VAS 0.55 (range, 0-7.4) in the ginger group was lower than in the placebo group 2.80 (range, 0-10) ($p = 0.015$, 95%CI from -3.61 to -0.73). Incidence of vomiting was also lower in the ginger group (23.3%) compared to that in the placebo group (46.7%) ($p = 0.058$, 95%CI from -47% to 1%).

Since the VAS at 6 hours post operation might be affected by the use of opioid within the 2 hour post operation, the authors factored the result according to the use of opioid. The opioid use was approxi-

mated half in both groups (43.4% and 53.3%). So, this created subgroup VAS and they were analyzed at 6 hr post operation between the pethidine received group and no pethidine received group. In the pethidine received group, median VAS was 1.30(range, 0-4.50) in the ginger group and was lower in the placebo group 5.70 (range, 0-10.0) (p = 0.036, 95%CI from -3.83 to -0.86). But in the no pethidine received group, the VAS of either groups were not significantly different, 0 (range, 0-7.4) and 0.3 (0-7.3) (p = 0.432, 95%CI from -2.64 to 1.05).

Side effects such as abdominal discomfort, heartburn, flu-like symptoms and insomnia found at 2 hours and 6 hours post operation in the ginger group were at 16.7% and 6.7% compared to 23.3% and 13.3% in the placebo group. There were no significant differences in either group (p = 0.519, 95%CI from -6.77% to 5.44%), (p = 0.671, 95%CI from -4.60% to 3.26%).

Discussion

Nausea and vomiting are common complications of laparoscopic surgery. They are caused by pneumoperitoneum with subsequent diaphragmatic irritation[1,2,4] and increased arterial carbon dioxide tension (PaCO2) from abdominal insufflations of CO2 that could trigger cortical afferent fiber sending impulse to the

Table 1. The demographic baseline characteristics as shown in mean (SD), median (range) and number (%)

Data	Ginger group (n = 30) (%)	Placebo group (n = 30) (%)
Age (years)		
Mean ± SD	34.37±5.86	34.93±7.15
Weight (kg)		
Mean ± SD	51.63±6.23	55.30±9.16
Occupation		
Government official	6 (20.0)	5 (16.7)
Company official	11 (36.7)	14 (46.7)
Trader, housewife, employee	13 (43.3)	11 (36.6)
Past illness history		
No	24 (80.0)	25 (83.3)
Yes*	6 (20.0)	5 (16.7)
Postoperative nausea vomiting history		
No	28 (93.3)	27 (90.0)
Yes	2 (6.7)	3 (10.0)
Type of laparoscopic surgery		
Diagnosis and lysis adhesion	11 (36.7)	11 (36.7)
Salpingectomy	1 (3.3)	1 (3.3)
Cystectomy	12 (40.0)	14 (46.7)
Myomectomy	6 (20.0)	4 (13.3)
Duration of surgery (minutes)		
Median (range)	137.5 (60-300)	145 (55-270)
Analgesics useIntraoperative		
No	1 (3.3)	1 (3.3)
Morphine 3-10 mg	11 (36.7)	12 (40.0)
Fentanyl 50-100 g	18 (60.0)	17 (56.7)
Postoperative within 0-2 hour		
No	16 (53.3)	11 (36.7)
Pethidine	13 (43.4)	16 (53.3)
Other**	1 (3.3)	3 (10.0)
Postoperative 2-6 hour		
No	25 (83.3)	26 (86.6)
Pethidine	5 (16.7)	2 (6.7)
Other**	0 (0.0)	2 (6.7)

* Hypertension, thyroid, major depression, migraine, allergic rhinitis, thalassemia, herniated disc
** Tramol , Diclofenac , Paracetamol

Table 2. VAS at 2 and 6 hour postoperation of both groups

Postoperative time	Median VAS (range)		Difference (95%CI)	p-value
	Ginger group	Placebo group		
2 hour	0 (0-5.40)	0.15 (0-10)	-2.59, 0.90	0.142
6 hour	0.55 (0-7.40)	2.80 (0-10)	-3.61, -0.73	0.015

Table 3. Presences of vomiting at 2 and 6 hour postoperation

Presence of vomiting	Group		Difference (95%CI)	p-value
	Ginger n = 30 (%)	Placebo n = 30 (%)		
Postoperative 0-2 hour				
No	27 (90.0%)	24 (80.0%)		
Yes	3 (10.0%)	6 (20.0%)	-28%, 8%	0.278
Postoperative 2-6 hour				
No	23 (76.7%)	16 (53.3%)		
Yes	7 (23.3%)	14 (46.7%)	-47%, 1%	0.058

Table 4. Subgroup analysis of VAS at 6 hour postoperation

Group	Median VAS at 6 hour (range)		Difference (95%CI)	p-value
	Ginger group	Placebo group		
Pethidine	1.30 (0-4.50)	5.70 (0-10)	-3.83, -0.86	0.036
No Pethidine	0 (0-7.40)	0.30 (0-7.3)	-2.64, 1.05	0.432

vomiting center. These mechanisms presented clinically as nausea and vomiting[4,23].Multiple predisposing factors associated with postoperative nausea vomiting included female gender, obesity, previous history of postoperative nausea vomiting, anxiety, pain, prolonged operative procedure, opioid use, abdominal surgery and general anesthesia[5,24,25].

In the present study, there were no differences among both groups with respect of the patient's demographics data, type of operation, anesthetic process and opioid use during operation.

Ginger has an action to increase gastric motility, absorption neutralizing toxins and acids, and block gastrointestinal reactions and subsequent nausea feedback[7]. The aromatic and carminative properties of ginger suggest an action on the gastrointestinal tract[9-11,26] without CNS effect[3,7,27]. Although ginger has long been recognized for its antiemetic effect, the optimal dose has not been established[3,9,10].

The present study used ginger 1.5 grams. This was found to be safe and without toxic side effect. The authors found that VAS at 2 and 6 hours post operation in the ginger group were lower than that in the placebo group. However, the difference proved significant only at 6 hour post operation (p = 0.015, 95%CI from -3.61 to -0.73). In addition, the present study showed that VAS at 2 hours post operatively was lower than 6 hours postoperation in both groups. The underlying reasons were:

1) Pain and mobilization when the patient was moved from the recovery room to the ward after 2 hours post operation could trigger the nausea vomiting mechanism.

2) Analgesic use, e.g. pethidine , at post operative 2 hours caused nausea vomiting side effect within 4 hours after administration. There were unavoidable and ethical reasons to giving potent post operative analgesia to patient.

The VAS of pethidine received group and no pethidine received group at 6 hour post operation were compared. There was no significant difference of VAS between the ginger and placebo groups. But in the pethidine received group, there was significant lower VAS in the ginger group compared to placebo ($p = 0.036$, 95%CI from -3.83 to -0.86). Interestingly, the authors also found that ginger was effective in reducing nausea side effects from the unavoidable opioid for severe postoperative pain.

The incidences of vomiting at 2 and 6 hours post operation in the ginger group were lower than that in the placebo group however, at 6 hours post operation, it was borderline significant ($p = 0.058$, 95%CI from -47% to 1%).

The authors concluded that ginger was efficacious in preventing nausea rather than vomiting at 6 hours post operation. The limitation of the present study may be the small sample size for detecting the difference of antiemetic effect, against vomiting, which occurred with a lower incidence.

Other studies also reported efficacy of ginger in prevention nausea and vomiting. Phillip et al[3] found that ginger was effective in preventing post operative nausea and vomiting. Despite lower ginger powder use of 1 gm. and much shorter duration of surgery (diagnostic laparoscopy), the result was compatible with the present study that the incidence of post operative nausea vomiting in the ginger group was lower than the placebo group. In the same way, Pongrojpaw et al[8] reported that ginger significantly reduced the incidence of post operative nausea vomiting at 2 and 4 hours, in some laparoscopic procedures (laparoscopic tubal sterilization, laparoscopic diagnosis, and laparoscopic cystectomy), with a shorter duration of operation and post operative analgesic used that was not clearly defined.

In contrast, Arfeen et al[20] and Visalyaputra et al[21] reported negative results of ginger. This was probably due to timing of assessment as it was only a single evaluation at post operation. Furthermore, the patient's ability to communicate after anesthesia was limited. Leopold et al[22] reported that ginger was ineffective however, the study gave a low dose of ginger that probably did not reach the therapeutic level.

As a general principle, the side effect from any drug usage should be an important consideration. Ginger had no severe side effects in any of the authors' treatment and is similar to previous studies[3,7,8]. Some side effects including abdominal discomfort, heartburn and flu-like symptom were presented in some of the presented cases. That might be caused by the hot, spice and gastrointestinal irritation effect of ginger. Insomnia appeared in some patients and was most likely the effect of opioid.

The route of ginger usage is limited with no parenteral administration. Oral form of ginger as premedication may be the problem of anesthetic process. Capsule preparation may protect gastrointestinal irritation but it is difficult to swallow especially if preoperative fluid intake is limited. The other consideration is that ginger is an herbal medicine, so there is no definite quality control of the preparation.

Conclusion

Ginger is effective for the prevention of nausea and borderline significance to prevent vomiting after gynecological laparoscopy with no significant side effect. Moreover, antiemetic effect on post operative opioid use for severe pain was surprisingly significant. However, the present study compared only a small number of patients and in limited indication of post operative laparoscopic surgery. For further study, the authors need a larger number of patients and more indications are warranted.

References

1. Nzoghe NP, Ogowet IN, Pither S, Ngaka ND. Ambulatory laparoscopic gynecological surgery in African: feasibility. Eur J Gynecol Obstet Biol Reprod 2001; 30: 462-6.
2. Hedayati B, Fear S. Hospital admission after day case gynaecological laparoscopy. Br J Anaesth 1999; 83: 776-9.
3. Phillips S, Ruggier R, Hutchinson SE. Zingiber officinale (ginger) and antiemetic for day case surgery. Anaesthesia 1993; 48: 715-7.
4. Borten M. Postoperative complications. In: Friedman EA, editor. Laparoscopic complications. 1st ed. Kowloon: Holt-Saunders; 1986: 406-14.
5. Nakata DA, Stoelting RK. Postoperative nausea and vomiting. In: Atlee JL, editor. Complications in anesthesia. 1st ed. Philadelphia: WB Saunders Company; 1999: 195-8.
6. Ernst E, Pittler MH. Efficacy of ginger for nausea and vomiting: a systematic review of randomized clinical trials. Br J Anaesth 2000; 84: 367-71.
7. Bone ME, Wilkinson DJ, Young JR, Mcneil J, Charlton S. Ginger root-a new antiemetic: the effect of ginger root on postoperative nausea and vomiting after major gynecological surgery. Anaesthesia 1990; 45: 669-71.

8. Pongrojpaw D, Chiamchanya C. The efficacy of ginger in prevention of post-operative nausea and vomiting after outpatient gynecological laparoscopy. J Med Assoc Thai 2003; 86: 244-50.
9. World Health Organization. Hizoma Zingerbiris Monograph. In: WHO, editor. Monographs on selected medicinal plants. 1st ed. Geneva: World Health Organization, 1999: 277-87.
10. Tyler VE. Herbal medicine. Newton: Laulanes' Publishers; 2002: 78-83.
11. Holtmann S, Clarke AH, Scherer H, John M. The anti-motion sickness mechanism of ginger: a comparative study with placebo and dimenhydrinate. Acta Otolaryngol (Stockh) 1989; 108: 168-74.
12. Verma SK, Singh J, Khamesra R,Bordia A. Effect of ginger on platelet aggregation in man. Indian J Med Res 1993; 98: 240-2.
13. Janssen PL, Meyboom S, Vanstaveren WA, Devegt F, Katan MB. Consumption of ginger (Zingiber officinale roscoe) dose not affect in vivo platelet thromboxane production in humans. Eur J Clin Nutr 1996; 50: 772-4.
14. Lumb A. Effect of dried ginger on human platelet function. Thromb Haemost 1994; 71: 110-1.
15. Srivastava KC. Aqueous extracts of onion, garlic and ginger inhibit platelet aggregation and after arachidonic acid metabolism. Biomed Biochim Acta 1984; 43: 335-46.
16. Backon J. Ginger in preventing nausea and vomiting of pregnancy: a caveat due to its thromboxane synthetase activity and effect on testosterone binding. Eur J Obstet Gynecol Reprod Biol 1991; 42: 163-4.
17. Grontved A, Brask T, Kambskard J, Hentzer E. Ginger root against sea sickness: a controlled trial on open sea. Acta Otolaryngol 1988; 105: 45-9.
18. Fischer-Rasmussen W, Kjaer SK, Dahl C, Asping U. Ginger treatment of hyperemesis gravidarum. Eur J Obstet Gynecol Reprod Biol 1990; 38: 19-24.
19. Pace JC. Oral ingestion of encapsulated ginger and reported self-care actions for the relief of chemotherapy - associated nausea and vomiting. Dissertations Abstracts Int 1987; 47: 3297-B.
20. Arfeen Z, Owen H, Plummer JL, Ilsley AH, Sorby-Adams RA, Doecke CJ. A double-blind randomized controlled trial of ginger for the prevention of postoperative nausea and vomiting. Anaesth Intensive Care 1995; 23: 449- 52.
21. Visalyaputra S, Petchpaisit N, Somcharoen K, Choavaratana R. The efficacy of ginger root in the prevention of postoperative nausea and vomiting after outpatient gynaecological laparoscopy. Anaesthesia 1998; 53: 506-10.
22. Leopold HE, Roswitha M, Oliver B, Stergios T, Wolfgang H, Astrid MM, et al. Ginger does not prevent postoperative nausea and vomiting after laparoscopic surgery. Anaesth Analg 2003; 96: 995-8.
23. Palazzo MGA, Strunin L. Anesthesia and emesis II: prevention and management. Canadian Anaesth Soc 1984; 31: 407-15.
24. Korttila K. The study of postoperative nausea and vomiting. Br J Anaesth 1992; 69: 20.
25. Palazzo MGA, Strunin L. Anesthesia and emesis I: etiology. Canadian Anaesth Soc 1984; 31: 178-87.
26. Tyler VE, Foster S. Herbs and ytomedicinal product. In: Covington TR, Beradi RR, Young LL, editors. Handbook of subscription drugs. 11th ed. Washington DC: American Pharmaceutical Association; 1996: 697.
27. Holtmann S, Clarke AH, Scherer H, Hohn M. The antimotion sickness mechanism of ginger. Acta Otolaryngol 1989; 108: 168-74.

ประสิทธิผลของขิงในการป้องกันภาวะคลื่นไส้อาเจียนภายหลังการผ่าตัดผ่านกล้องทางนรีเวช

สิริรัตน์ อปริมาณ, สาวินี รัชชานนท์, บุษบา วิริยะสิริเวช

วัตถุประสงค์: *ศึกษาประสิทธิผลของขิงในการป้องกันภาวะคลื่นไส้อาเจียนภายหลังการผ่าตัดผ่านกล้องทางนรีเวช*
วัสดุและวิธีการ: *ทำการศึกษาตั้งแต่เดือนกรกฎาคม พ.ศ. 2548 ถึงเดือนตุลาคม พ.ศ. 2548 มี จำนวนผู้ป่วย 60 ราย โดยเป็นผู้ป่วยในที่ไม่มีโรคทางมะเร็งนรีเวชและเข้ารับการผ่าตัดผ่านกล้อง ณ วิทยาลัยแพทยศาสตร์ กรุงเทพมหานคร และวชิรพยาบาล ทำการสุ่มแบ่งเป็น 2 กลุ่ม กลุ่มละ 30 ราย กลุ่มแรกได้รับขิง 3 แคปซูล (1 แคปซูลบรรจุขิงผงขนาด 0.5 กรัม) กลุ่มที่สองได้รับยาหลอกจำนวน 3 แคปซูล รับประทานก่อนเข้ารับการผ่าตัด 1 ชั่วโมงเช่นเดียวกันทั้งสองกลุ่ม ทำการประเมินภาวะคลื่นไส้อาเจียนโดยใช้ระดับคะแนนความคลื่นไส้ (visual analogue score) และอุบัติการณ์ของการอาเจียนหลังผ่าตัดที่ 2 และ 6 ชั่วโมง*
ผลการศึกษา: *ค่าคะแนนความคลื่นไส้ที่ 2 ชั่วโมงหลังผ่าตัดของกลุ่มขิง ไม่มีความแตกต่างอย่างมีนัยสำคัญ เมื่อเทียบกับยาหลอก โดยมีคะแนนเฉลี่ย 0 (0-5.4) และ 0.15 (0-10) ตามลำดับ (p = 0.142, 95%CI อยู่ระหว่าง -2.59 ถึง 0.90) ส่วนที่ 6 ชั่วโมงหลังผ่าตัด ค่าคะแนนความคลื่นไส้ในกลุ่มขิงต่ำกว่ากลุ่มยาหลอกอย่างมีนัยสำคัญ มีคะแนนเท่ากับ 0.55 (0-7.4) และ 2.80 (0-10) (p = 0.015, 95%CI อยู่ระหว่าง -3.61 ถึง -0.73) อุบัติการณ์ของการอาเจียนที่ 2 ชั่วโมงหลังผ่าตัดไม่มีความแตกต่างกันทั้งสองกลุ่ม โดยพบ 10% ในกลุ่มขิง และ 20% ในกลุ่มยาหลอก (p = 0.278, 95%CI อยู่ระหว่าง -28% ถึง 8%) แต่ที่ 6 ชั่วโมงหลังผ่าตัดมีความแตกต่างระหว่างสองกลุ่มแบบไม่ชัดเจน พบการอาเจียน 23.3% ในกลุ่มขิงเทียบกับ 46.7% ในกลุ่มยาหลอก (p = 0.058, 95%CI อยู่ระหว่าง -47% ถึง 1%)*
สรุป: *ขิงมีประสิทธิผลในการป้องกันภาวะคลื่นไส้และมีแนวโน้มในการป้องกันการอาเจียนภายหลังการผ่าตัดผ่านกล้องทางนรีเวชที่ชั่วโมงที่ 6 หลังการผ่าตัด*