
Original Article

The Role of Nursing in a Set of Newly Established Clinical Pathways for Patients Undergoing Minimally Invasive Gynecological Surgery in a Tertiary Referral Hospital Setting

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Objectives: This study aimed at evaluating the necessity of adopting the concept of clinical pathway for patients receiving minimally invasive gynecological surgery (MIGS) and introducing a set of clinical pathways incorporating evidence-based practice into medical and nursing care.

Methods: The numbers of patients undergoing MIGS at a tertiary referral hospital from January 2013 to December 2015 were recorded. A set of pathways was designed for patients scheduled for MIGS with the incorporation of best available evidence based on information retrieved from electronic databases including Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, PubMed, Up-To-Date, and National Guideline Clearinghouse (AHRQ).

Results: The number of patients receiving MIGS in the year 2013, 2014, and 2015 was 842, 983, and 1015, respectively, with persistent elevations by 16.7% and 3.3% from 2013 to 2015. A set of clinical pathways covering the whole course of patient care was developed in February 2016, including different items for preoperative (12 items), intraoperative (15 items), postoperative (13 items), and discharge (9 items) planning, emphasizing on evidence-based practice and teamwork.

Conclusions: A set of clinical pathways were developed to cope with the increasing need for MIGS in a tertiary referral hospital setting. The pathways were designed not only do cover the whole period of patient care from admission to discharge, but also to provide an evidence-based basis for medical and nursing practice.

Key words: minimally invasive gynecological surgery, clinical pathway, surgical patient safety, complication prevention, discharge plan

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Introduction

Compared with conventional gynecological surgical procedures, minimally invasive gynecological surgery (MIGS) has become the mainstay of treatment for patients with benign surgical gynecological conditions. Not only has MIGS been reported to be associated with fewer episodes of wound or abdominal wall infections compared to traditional hysterectomy procedures,¹ but it has also been demonstrated to cause significantly less blood loss compared to the traditional procedures.² Besides, patients who underwent MIGS have also been shown to require significantly less medications for postoperative pain control compared to those underwent conventional surgeries.³

Clinical pathway, which comprises standardized procedures developed to guide evidence-based health care to avoid inconsistent practice,⁴ has been widely applied in various clinical disciplines.⁵ The aims of a clinical pathway are not only to promote quality of care and improve clinical outcome,⁶ but also to standardize important aspects of care as well as to avoid unnecessary delays and to reduce costs.⁷ It has been reported that the hospital length of stay, procedure-related complications, hospital costs, and the incidence of malpractice can be reduced by using clinical pathways.⁸ Indeed, clinical pathways have been shown to be associated with reduced in-hospital complications and improved documentation without negative impact on the length of stay and expenditure.⁷ In surgical practice, clinical pathways have been demonstrated to decrease the length of stay by 40% and 33% for open surgery and minimally invasive surgery, respectively.⁹

Through organizing and implementing clinical pathways as an effective interdisciplinary communication tool to meet the same standard of care,¹⁰ nursing staff act as key coordinators in the improvement of efficiency and

optimization of hospital resources.⁴ Despite previous studies on the role of nursing in clinical pathways, the application of a nursing approach in minimally invasive gynecological operations has not been reported.

Focusing on minimally invasive gynecological surgery (MIGS), the aims of the present study were (1) to assess the need for clinical pathway in the setting of a tertiary referral hospital (i.e., E-Da Hospital) by reviewing the number of patients undergoing MIGS and the costs involved in recent three years, and (2) to introduce a set of practical clinical pathways for MIGS emphasizing on nursing that may serve as a reference for other medical institutes of similar settings.

Methods

Study protocol

The number of patients of all ages undergoing minimally invasive gynecological surgeries (MIGS) from January 2013 to December 2015 at a single tertiary referral hospital (E-Da Hospital) before the implementation of the clinical pathways in February 2016 were recorded and compared on an annual basis. A set of four evidence-based clinical pathways from pre-operative assessment to discharge planning were developed for patients undergoing MIGS emphasizing on nursing.

Definition of terms

Minimally invasive gynecological surgeries (MIGS) include gynecological laparoscopic and hysteroscopic procedures with or without concomitant procedures on other organ systems. A clinical pathway is defined as one that is structured and multidisciplinary that focuses on one specific medical condition and is designed based on the best available evidence for improving the quality of health-care,¹⁰ enhancing patient safety, and reducing the cost of medical therapy.^{4,5}

Literature review and level of evidence assessment

Literature review regarding the procedures and uses of medication in the clinical pathways was based on a review of information acquired from electronic databases including Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, PubMed, Up-To-Date, and National Guideline Clearinghouse (AHRQ). Appraisal of the literature was performed using the 2011 Oxford Centre for Evidence-Based Medicine levels of evidence.¹¹

Results

Characteristics of patients undergoing MIGS before clinical pathway implementation

According to the definition of MIGS as defined above, the number of patients receiving MIGS at E-Da hospital in the year 2013, 2014, and 2015 was 842, 983, and 1015, respectively. There were persistent increases by 16.7% and 3.3% from the year 2013 to 2015.

Development of clinical pathways for MIGS

Based on the above-mentioned databases, our nursing team in the Gynecology Department at E-Da Hospital developed a set of preoperative, intraoperative, postoperative, and discharge clinical pathways for patients undergoing MIGS. Each clinical pathway has its special features which are introduced as follows.

(1) Preoperative pathway

The preoperative clinical pathway augments patient safety by emphasizing on correct admission procedures, completeness of data collection and patient evaluation including results of laboratory tests and imaging studies, consultant's opinions (e.g., those from anesthesiologist) as well as preoperative respiratory training. The 12 items included in the pathway are as listed in Table 1.

(2) Intraoperative pathway

The main features of the intraoperative pathway include confirming the accuracy and completeness of the patient's information and pre-operative medications as well as providing the surgeon with optimal support from anesthesiologists and nursing staff to maximize the efficiency of the team and to ensure patient safety during the procedure. Besides, signs of complications were also monitored. The 15 items included are shown in Table 2.

Table 1. Procedures included in the preoperative pathway

Item No.	Procedure
1	Patient will be admitted to the Gynecology Unit a day before the operation and oriented. The procedure information booklet will be provided. Pre-operation anxiety will be addressed and reduced.
2	Patient's medication, food supplement, drug abuse, and allergy history will be assessed.
3	A nurse will take the patient's medical history and assess the patient's psychological status and physical condition. Patient's physiological, psychological, spiritual and social needs will be evaluated.
4	A member of the surgical team will provide explanation and clarification regarding MIGS procedure and obtain informed consent.
5	Contraindicated medications, including herbal products, NSAIDs, anticoagulants, aspirin, and anti-platelet agents will be discontinued at the discretion of the responsible physician.
6	Consultation by anesthesiologist who will explain procedures related to anesthesia.
7	Patient will be on NPO after midnight or at least for 6-8 hours.
8	Pre-operative tests including EKG, chest X-ray, CBC, SMAC-7, PT/PTT, and urinalysis will be completed.
9	Bowels will be prepared with enema. (Only for laparoscopy)
10	Patient will be instructed to remove contact lens, removable dentures, jewelry and nail polish prior to the surgery.
11	Patient will be educated about the risk of falling due to anesthesia or pain killers after the surgery.
12	Patient will be instructed to practice deep breaths using incentive spirometer, and to cough to prevent pneumonia after the operation.

NSAIDs: Non-steroid anti-inflammatory drugs; EKG: Electrocardiogram; CBC: Complete blood count; SMAC-7: Sequential multi-channel analysis with computer-7; PT: Prothrombin time; APTT: activated partial thromboplastin time.

Table 2. Procedures included in the intraoperative pathway

Item No.	Procedure
1	Recheck vital signs and NPO status
2	Review medication and allergy history
3	Review the current blood works and test results
4	Ensure that antibiotics and other medications are on chart for transfer to the operating room
5	Review anesthetic considerations such as airway management and pain control
6	Shave the procedure area with skin cleaning
7	Per E-Da hospital's policies and standard procedures, take a "time-out" to confirm: Patient's identity, site(s) to be operated, and procedures to be done ¹⁷
8	Plan for the intraoperative equipment needs
9	Adjust the position of patient on operating table
10	Insert bladder Foley catheter as needed
11	Clean and drape the patient's incision site
12	Implement a surgical time-out to confirm patient's identity, technical and anesthetic details as well as the patient's antibiotic prescription ¹⁸
13	Assist the attending doctors during the procedures
14	Monitor the signs of bleeding, such as hypotension or tachycardia
15	Plan for intraoperative IV fluid balance to prevent hyper- or hypovolemia

Table 3. Procedures included in the postoperative pathway

Item No.	Procedure
1	Check vital signs and airway patency: q.1.h. for 2 hours followed by q.2.h. twice, then q.4.h. twice, then q.8.h. or b.i.d
2	Check patient's consciousness levels
3	Monitor any symptoms, such as anesthesia-induced nausea and vomiting
4	Monitor wound dressings and drainage: check incision site(s) and the patency of the drain(s) while checking vital signs
5	Pain management
6	Advance patient's diet as tolerated
7	Educate patient about smoking, alcohol drinking and spicy food
8	Prevent post-operative constipation: mobilize the patient early; adequate hydration; consider stool softener if needed
9	Instruct patient to continue to take deep breath and cough
10	Prevent DVT: Mobilize the patient early (Grade 1B) ¹³
11	Preventing UTI: Remove the Foley catheter as soon as possible. Inform the patient that cranberry products are effective in reducing recurrent UTIs (Level I-A) ¹⁵
12	Emphasize the risk of falling due to pain killers or other sedative medications to the patient
13	Recognize the signs and symptoms of infections(i.e., fever, pain, or swelling of the wound(s))

DVT: Deep vein thrombosis; UTI: Urinary tract infection

(3) Postoperative pathway

The postoperative pathway covers procedures contributing to health care quality and patient safety throughout the whole postoperative period, including ensuring of stable vital signs and neurological recovery with particular attention being paid to signs of complications from blood loss or anesthesia, postoperative pain control, nutritional support, health education regarding modifications of habits and defecation, physical rehabilitation, prevention of infection and falling, and conditions suggestive of infection that mandate medical attention. The 13 items included in the pathway are shown in Table 3.

(4) Discharge pathway

The distinctive feature of the discharge pathway is that it consists of two components catering for medical and nursing discharge

planning (Table 4). While the medical discharge plan focuses on instructions regarding medication, the nursing component emphasizes on hygiene, nutritional maintenance, physical exercises as well as signs and symptoms that require immediate medical attention.

Discussion

In response to the persistent annual increase in the number of patients receiving MIGS at a single tertiary referral hospital, a set of clinical pathways was developed in an attempt to promote the quality of health care and to enhance patient safety. Not only are the clinical pathways practical and detailed, but they are also evidence-based to try to incorporate the latest standards of health care into

Table 4. Procedures included in the discharge pathway

Medical discharge plan	
1	Instruct patient to resume medications and to take pain killers as needed.
2	Make an appointment with primary physician and surgeon for stitch removal if needed.
Nursing discharge plan	
1	Keep appropriate hygiene (I-A) ¹⁶
2	Educate patient the wound care and monitor the wounds with any abnormal swelling, drainage, or bleeding
3	Encourage well-balanced diet and taking plenty of fluid to avoid constipation
4	Avoid weight lifting, no more than 5 kg
5	Avoid sexual activities for 6-8 weeks
6	Avoid bicycle or motorcycle riding, sitting for a long period of time, or being overactive
7	Call surgeon for high fever, newly-developed pain, fresh and/or heavy vaginal bleeding

DVT: Deep vein thrombosis; UTI: Urinary tract infection

medical and nursing practice.

Realizing that proper use of a preoperative checklist in the promotion of patient's safety has been reported to be at the Grade 1C level of evidence¹² (i.e., strong recommendation because potential benefits would outweigh detrimental outcomes), our nursing team at the Gynecology Department gathered the best available evidence-based practice information to develop the checklist for the preoperative clinical pathway for patients undergoing MIGS. Following the same concept, the intraoperative, postoperative, and discharge checklists were incorporated into the respective clinical pathway to ensure completeness and consistency of practice at all levels throughout the whole period of patient care. Besides, the idea of evidence-based practice was emphasized throughout the design of the pathways to ensure high-quality practice. For instance, mobilizing the postoperative patient early to prevent deep vein thrombosis (DVT) has been reported to be at the evidence level of Grade 1B¹³ that suggests strong recommendation of its use as a prevention measure against DVT. In addition, providing postoperative patient with adequate hydration,¹⁴ removing their indwell-

ing Foley catheters as soon as possible¹⁵ as well as informing the patients that cranberry products are effective in reducing recurrent urinary tract infection¹⁶ all belong to Grade I-A level of evidence, which signifies evidence obtained from at least one properly conducted randomized controlled trial.¹⁶ Therefore, these procedures, which are strongly recommended precautions against adverse outcomes are incorporated into the present clinical pathways for patients receiving MIGS.

Limitations

The present report has its limitations. First, no data are available regarding health care quality and patient safety after the implementation of the clinical pathways because they have just been established. The changes in parameters can only be compared after a period of data collection following pathway implementation. Secondly, the usefulness of clinical pathway for minimally invasive surgeries in other disciplines (e.g., urology, general surgery) was not explored. Therefore, more data are needed for verifying the benefits of clinical pathway in those settings.

In conclusion, in view of the increasing use of MIGS for patients conventionally treated with open surgeries, a set of clinical pathways was developed in a tertiary referral hospital setting. Not only do the pathways cover the whole period of patient care from admission to discharge, but they were also designed on an evidence-based basis in an attempt to provide high-quality and consistent medical and nursing care for this patient population.

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