

# Technicity Index: A Quality Indicator to Improve Patient Care

Chethana Bolanthakodi<sup>1</sup>, Prema D'Cunha<sup>2</sup>

## ABSTRACT

**Introduction:** Hysterectomy is a common gynecological procedure performed worldwide. Most of the international guidelines state that whenever feasible, they have to be performed vaginally or laparoscopically or with laparoscopic assistance as it is beneficial to patients. But majority are still being done by laparotomy. Minimally invasive surgery (MIS) is being widely adopted nowadays, and we need quality and performance indicators to analyze their benefits. One such indicator is technicity index (TI). Technicity is defined as the number of hysterectomies performed vaginally [non-descent vaginal hysterectomy (NDVH)] and laparoscopically [laparoscopic-assisted vaginal hysterectomy (LAVH) and total laparoscopic hysterectomy (TLH)] over the total number of hysterectomies performed in a particular health facility, in a year.

**Objective:** To determine the TI from January 2014 to December 2018.

**Materials and methods:** This was a retrospective, observational study in which the approach to all hysterectomies performed during January 2014 to December 2018 was recorded at Father Muller Medical College, Mangaluru. Hysterectomies done for obstetric indications and malignancies were excluded. The routes adopted for all types of hysterectomies were calculated, and the TI was calculated for every year.

**Results:** In total, 2,268 hysterectomies were performed in 5 years, of which 222 (9.7%) were laparoscopic, 301 (13.27%) vaginal, and 1,745 (76.94%) total abdominal hysterectomies. The TI ranged from 17.21% to 29.11%. The average index for 5 years was 23.05%.

**Conclusion:** Technicity index can be used to monitor shift toward minimally invasive procedures in our department. Assessing our level of care is necessary to effectively modify patient care. We can approach a higher TI by allocating resources to teach and provide MIS.

**Keywords:** Laparoscopic hysterectomy, Minimally invasive surgery, Non-descent vaginal hysterectomy, Technicity Index.

*Journal of South Asian Federation of Obstetrics and Gynaecology* (2019); 10.5005/jp-journals-10006-1741

## INTRODUCTION

Surgical removal of the uterus is the most common non-obstetric surgical procedure performed for a variety of benign and malignant indications.<sup>1</sup> This procedure can be performed abdominally, vaginally, or laparoscopically. Numerous studies have demonstrated that the patient morbidity is less with minimally invasive approach (vaginal and laparoscopic routes) to hysterectomy than when performed by the abdominal route.<sup>2-4</sup>

Various international guidance statements on hysterectomy for benign indications have favored MIS, of which the first choice should be the vaginal route, followed by laparoscopy when the vaginal approach is not feasible. Laparotomy should be the last resort.<sup>2,5,6</sup>

For advocating minimally invasive techniques, a tool which distinctly demonstrates the benefits and hazards of various routes of hysterectomy is required. Technicity is one such tool. In the context of hysterectomy, technicity is defined as the number of hysterectomies performed vaginally (NDVH) and laparoscopically (LAVH, laparoscopic supracervical hysterectomy, and TLH) over the total number of hysterectomies performed in a single health facility, in a year.<sup>7</sup>

$$\text{Technicity}^7 = \frac{\text{Number of vaginal + Laparoscopic hysterectomies}}{\text{Total number of hysterectomies}}$$

This concept was initially used in France to rate hospitals in terms of quality care. The highest technicity reported was 90%, in 2008, in the gynecology department of Clermont-Ferrand.<sup>8</sup>

Technicity was based on the strong evidence that vaginal hysterectomy (VH) and laparoscopic hysterectomy (LH) have better outcomes than with the abdominal approach. There have been many studies comparing the approaches to hysterectomy, as well as publications in journals, and majority of them have centered

<sup>1,2</sup>Department of Obstetrics and Gynaecology, Father Muller Medical College, Mangaluru, Karnataka, India

**Corresponding Author:** Chethana Bolanthakodi, Department of Obstetrics and Gynaecology, Father Muller Medical College, Mangaluru, Karnataka, India, Phone: +91 09901892381, e-mail: bc3bhat@yahoo.co.in

**How to cite this article:** Bolanthakodi C, D'Cunha P. Technicity Index: A Quality Indicator to Improve Patient Care. *J South Asian Feder Obst Gynae* 2019;11(6):368-370.

**Source of support:** Nil

**Conflict of interest:** None

on five health determinants to compare the outcomes. These are duration of surgery, length of stay in hospital, complication rate, hospital cost, and quality of life.<sup>9-11</sup>

Based on the conclusions pertaining to these criteria, to demonstrate the advantages of minimally invasive techniques and to make it clinically relevant, the technicity index (TI) was devised. To device the scoring system, for every approach of hysterectomy, points were assigned from 1 to 3, for each of the five determinants as follows:

- Operating time: shorter is better
- Length of hospital stay: shorter is better
- Complication rate: lower is better
- Total cost: lower is better
- Postoperative return to activity: quicker is better

When the outcome was definitely better than the others, 3 points were given, 2 points for an average outcome, and 1 point when the outcome was poorer when compared with other approaches. Higher the index, better is the patient care.<sup>7</sup>

The use of MIS has been advancing in gynecology. To gauge the approaches to hysterectomy which is most advantageous to the patients, we require performance indicator tools.<sup>8</sup> Technicity index is one such indicator. Our objective was to calculate the TI for the past 5 years, thereby evaluating the trend of hysterectomies as well as to monitor our shift to MIS.

**MATERIALS AND METHODS**

We carried out an observational study, retrospectively over a period of 5 years between January 2014 and December 2018, at Father Muller Medical College, Mangaluru, in the Department of Obstetrics and Gynaecology. Patients who underwent hysterectomy for any benign indication were included. Hysterectomies done for malignancy and obstetric indications were excluded. The frequency of different approaches to hysterectomy was calculated for each year. From these data, the year-specific TI was calculated. Vaginal hysterectomies done for uterovaginal prolapse were also excluded while calculating TI. Data were analyzed using SPSS version 20.0 and presented in the form of charts and tables.

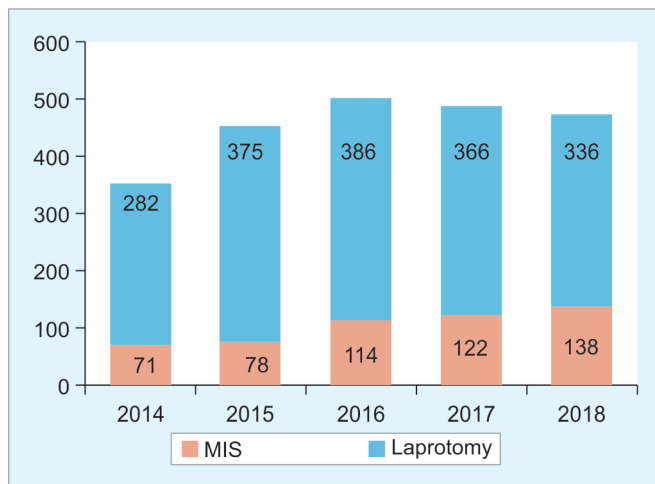
**RESULTS**

A total of 2,268 hysterectomies were performed between January 2014 and December 2018. Majority of them were performed by laparotomy (1,745, 76.94%) followed by vaginally (301, 13.27%) and laparoscopically (222, 9.7%). A cumulative TI for 5 years was 23.05% (Table 1 and Fig. 1). This means that 23.05% of all hysterectomies during the entire study period were performed through a minimally invasive approach (vaginally or laparoscopically).

In the year 2014, the TI was 20.11% which declined to 17.21% in 2015. There was a gradual increase to 22.8% in 2016, which further increased to 25% in 2017 and 29.11% in 2018 (Table 2 and Fig. 2).

**Table 1:** Cumulative technicity index of 2014–2018

Mode of hysterectomy	Number	Percentage	Technicity index (%)
Laparotomy/abdominal	1,745	76.94	23.05
Vaginal	301	13.27	
Laparoscopic (TLH/LAVH)	222	9.7	
Total	2,268		



**Fig. 1:** Comparison of routes of approach to hysterectomy

**DISCUSSION**

Worldwide, the commonest approach to hysterectomy is laparotomy. There have been many studies affirming the advantages of vaginal and laparoscopic hysterectomies over the abdominal route. With the abdominal approach, there is reduction in quality of life, a longer hospital stay, and a greater time for convalescence. Complications like secondary wound infections are higher and are also associated with poor cosmetic results.<sup>10</sup>

Many national and international health agencies strongly recommend the adoption of MIS for hysterectomy. The National Institute for Health and Care Excellence (NICE) guidance no. 44 for heavy menstrual bleeding in 2007 stated that vaginal approach is the first line of surgical management.<sup>12</sup> In June 2017, American College of Obstetrics and Gynecology (ACOG) addressed the choice of the route of hysterectomy in committee opinion no. 701 that minimally invasive surgical approaches (vaginal/laparoscopy) to hysterectomy should be performed whenever feasible, based on its well-documented advantages, lower complication rates, and costs.<sup>5</sup> A scientific impact paper by Royal College of Obstetrics and Gynecology (RCOG) on enhanced recovery in gynecology has also supported enhanced recovery with a preference toward laparoscopy whenever possible.<sup>13</sup> The American Association of Gynecologic Laparoscopists (AAGL) Position Statement on route of hysterectomy to treat benign uterine disease stated that when hysterectomy is necessary, VH and LH should be the approaches of choice due to their better safety, efficacy, and cost-effectiveness and that these methods have to be promoted.<sup>6</sup>

To monitor our progress in MIS, we have TI. Vaginal hysterectomy and LH which constitute MIS combined together form the TI. Significant changes can be stimulated using a simple calculation like the TI.<sup>7</sup> Technicity index will help us implement strategies to improve patient care by providing a comparative benchmark. A department with a higher TI denotes the better quality of patient care available.<sup>14</sup> It also helps in objectively assessing different surgeons in the same group. The rates of MIS of different hospitals, states, and countries can be compared using TI. In France, the TIs of various hospitals which provide are listed every year, details of which are available to everyone.<sup>8</sup> In the private sector, it would help in providing “state-of-the-art” health care, whereas it would help in improving patient care in the public health system.<sup>15</sup>

There have been many publications from all over the world, of the trend of their TIs (Table 3).

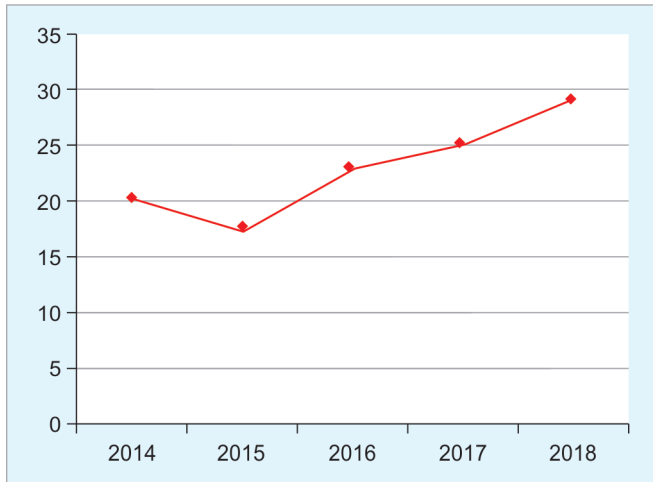
The overall TI of our institution was 23.05%. After an initial decline, the increase in TI in the past 3 years is explained by the availability of trained gynecologists, better awareness about MIS, as well as better equipment. We can further improve our TI by didactic courses for new gynecologists, hands on skill labs, intraoperative preceptorships by experts, tele mentoring to ensure progression in skills, and finally acquisition of better instruments.

**CONCLUSION**

Assessing our level of care is necessary to effectively modify patient care. Regular audits using indicators like TI would help us find discrepancies between the intended and actual performance. This study has demonstrated the importance of performing local audits to identify inconsistency between the anticipated and current surgical performance. Technicity index is a simple objective performance indicator which can help us to monitor our shift toward minimally invasive approach to hysterectomy, within an institution at national or international levels.

**Table 2:** Year-specific technicity indices from 2014 to 2018

Year	Laparotomy/abdominal	Vaginal	Laparoscopic (TLH/LAVH)	Total	Technicity index (%)
2014	282	50	21	353	20.11
2015	375	53	25	453	17.21
2016	386	76	38	500	22.8
2017	366	74	48	488	25.0
2018	336	48	90	474	29.11



**Fig. 2:** Trend of technicity indices from 2014 to 2018

**Table 3:** Technicity indices reported worldwide

Time period	Place	TI (%)
2008	Clermont-Ferrand, France <sup>8</sup>	90
2003–2009	Oman <sup>14</sup>	11–24
2005–2013	US <sup>16</sup>	40–78
2005–2010	California <sup>17</sup>	38–78
2007–2011	Vancouver, Canada <sup>18</sup>	41.6–52.3
2005–2012	Ottawa, Ontario, Canada <sup>19</sup>	40.1–74.2
2005–2006	Germany <sup>20</sup>	67.1
2010–2015	Sub-Saharan Africa <sup>21</sup>	25–8.3

**REFERENCES**

- Prusty RK, Choithani C, Gupta. SD. Predictors of hysterectomy among married women 15–49 years in india. *Reprod Health* 2018;15(1):3. DOI: 10.1186/s12978-017-0445-8.
- Thurston J, Murji A, Scattolon S, et al. SOGC clinical guidelines no. 377. hysterectomy for benign gynecological indications. *J Obstet Gynaecol Can* 2019;41(4):543–557. DOI: 10.1016/j.jogc.2018.12.006.
- Hoyer-Sorensen C, Hortemo S, Lieng M. Changing the route of hysterectomy into a minimal invasive approach. *Hindawi Publishing Corporation ISRN Obstetrics and Gynecology* 2013;2013:249357. DOI: 10.1155/2013/249357.
- Walsh CA, Walsh SR, Tang TY, et al. Total abdominal hysterectomy versus total laparoscopic hysterectomy for benign disease: a meta-analysis. *Eur J Obstet Gynecol Reprod Biol* 2009;144(1):3–7. DOI: 10.1016/j.ejogrb.2009.01.003.
- ACOG committee opinion no. 701. *Obstet Gynecol* 2017;129: e155-9. Available from <https://www.acog.org/-/media/Committee-Opinions/Committee-on-Gynecologic-Practice/co701.pdf?dmc=1%26ts=20170702T0930167819> [accessed 24th feb 2019].
- AAGL Advancing Minimally Invasive Gynecology Worldwide. AAGL position statement: route of hysterectomy to treat benign uterine

disease. *J Minim Invasive Gynecol* 2011;18(1):1–3. DOI: 10.1016/j.jmig.2010.10.001 Available from <https://www.aagl.org/wp-content/uploads/2013/03/aagl-hysterectomy-position-statement.pdf> [accessed 24th feb 2019].

- Laberge PY, Singh SS, et al. Surgical approach to hysterectomy: introducing the concept of technicity. *J Obstet Gynaecol Can* 2009;31(11):1050–1053. DOI: 10.1016/S1701-2163(16)34350-X.
- Lepoint.fr. Hôpitaux le palmarès 2008. Available at: <http://www.lepoint.fr/html/hopitaux-2008/chirurgie-gynecologique.jsp>, accessed 24 feb 2019.
- Robert Kovac S. Route of hysterectomy: an evidence-based approach. *Clin Obstet Gynecol* 2014;57(1):58–71. DOI: 10.1097/GRF.000000000000009.
- Nieboer TE, Johnson N, Lethaby A, et al. Surgical approach to hysterectomy for benign gynaecological disease. *Cochrane Database Syst Rev* 2009(1):CD003677. DOI: 10.1002/14651858.CD003677.pub4.
- Aarts JW, Nieboer TE, Johnson N, et al. Surgical approach to hysterectomy for benign gynaecological disease. *Cochrane Database Syst Rev* 2015(8):CD003677. DOI: 10.1002/14651858.CD003677.pub5.
- NICE guidance: Heavy menstrual bleeding; assessment and management, 2018. Available from <https://www.nice.org.uk/guidance/ng88/resources/heavy-menstrual-bleeding-assessment-and-management-pdf-1837701412549>, accessed 24 feb 2019.
- RCOG scientific impact paper no. 36. Enhanced recovery in gynecology. Feb 2013. Available from [https://www.rcog.org.uk/globalassets/documents/guidelines/scientific-impact-papers/sip\\_36.pdf](https://www.rcog.org.uk/globalassets/documents/guidelines/scientific-impact-papers/sip_36.pdf) accessed 24 feb 2019.
- Al-Khaduri M, Al-Farsi Y. Technicity as a quality indicator of excellence in gynaecology. *SQU Med J* 2012;12(1):93–96. DOI: 10.1016/j.jmig.2010.08.329.
- Renaud M-C, Plante M, Roy M. The technicity index: a useful performance indicator for minimally invasive surgery in the management of endometrial cancer. *J Obstet Gynaecol Can* 2012;34(12):1180–1183. DOI: 10.1016/S1701-2163(16)35466-4.
- Lim PC, Crane JT, English EJ, et al. Multicenter analysis comparing robotic, open, laparoscopic, and vaginal hysterectomies performed by high-volume surgeons for benign indications. *Int J Gynaecol Obstet* 2016;133(3):359–364. DOI: 10.1016/j.ijgo.2015.11.010.
- Andryjowicz E, Wray T. Regional expansion of minimally invasive surgery for hysterectomy: implementation and methodology in a large multispecialty group. *Perm J* 2011;15(4):42–46. DOI: 10.7812/TPP/11-093.
- Chen I, Lisonkova S, Allaire C, et al. Routes of hysterectomy in women with benign uterine disease in the vancouver coastal health and providence health care regions: a retrospective cohort analysis. *CMAJ Open* 2014;2(4):E273–E280. DOI: 10.9778/cmajo.20130080.
- Gale J, Cameron C, Chen I, et al. Increasing minimally invasive hysterectomy: a Canadian academic health centre experience. *J Obstet Gynaecol Can* 2016;38(2):141146. DOI: 10.1016/j.jogc.2015.12.004.
- Stang A, Merrill RM, Kuss O. Hysterectomy in Germany: a DRG-based nationwide analysis, 2005–2006. *Dtsch Arztebl Int* 2011;108(30): 508–514. DOI: 10.3238/arztebl.2011.0507.
- Theohile NN, Charlotte TN, Tolefac PN, et al. The trend of the technicity index of hysterectomy in a tertiary hospital in sub-Africa. *Inte Ann Med* 2017;1(6):3. DOI: 10.24087/IAM.2017.1.6.166.

