Implementation of Surgery Clinical Pathway for Training in Urologic Robotic Surgery: Preliminary Experience with the Radical Prostatectomy in Central America

Abstract

Introduction and Objective: Robotic surgery for urologic disease is becoming increasingly widespread. However, there is a known learning curve for this technology that can inhibit its adoption; this concern may be particularly important in an international, non-academic setting. Our institution introduced the first robotic system in our geographic region (Central America), and we reviewed our experience in implementing a training pathway for urologic robotic surgery, specially in radical prostatectomy.

Methods: In March 2012 a daVinci SI robotic system was installed at a private hospital in Panama; this was the first system installed in Central America. Our implementation pathway was comprised of an online virtual course, video reviews, on-site surgical system training, off-site Surgical skills training using animate and inanimate models, off site Live Procedure Observation, and on site surgery with an experienced preceptor. We prospectively tracked intra-operative parameters: time for patient preparation, docking of the robot, and console time. We also reviewed early patient results for radical prostatectomy.

Results: During a 48 month period, 500 robotic-assisted laparoscopic surgeries were performed. 210 urology cases included: 118 radical prostatectomies, 31 partial nephrectomies, 20 radical nephrectomies, 4 donor nephrectomy, 17 pyeloplasties, 3 sacrocolpexias, and 1 partial cystectomy. All surgeons complete the clinical pathway solution. Mean console time for the first 8 cases, with preceptor, was 251 minutes and for the following 31 cases 110 minutes. Regarding robotic-assisted laparoscopic radical prostatectomies: patient preparation was 17 min, docking time 5.6 min, console time 150 min. Total operative time range from 2 to 5 hours (Mean 210 minutes). Mean patient age was 61. Mean PSA 8 ng/ml. Average hospitalization days: 2.7 (range 1-14d) The dominant preoperative Gleason was 3 + 3, while the predominant postoperative was 4 + 3. There were no intra operative major complications.

Conclusion: Our structured clinical training program assisted in the rapid development of our robotic surgical program, and we believe was responsible for our safe and effective experience. As robotic surgery continues to expand to diverse international regions and non-academic institutions, detailed protocols such as ours can aid in its successful adoption elsewhere, as well.

Introduction

Prostate cancer is the most common malignant tumor in our country [1]. Radical surgery is used for the management of localized disease. Consistent results globally confirm the safety, reproducibility and effectiveness of roboticsurgery [2-4]. Robotic surgery for urologic disease is becoming increasingly widespread [5-6]. However, there is a known learning curve for this technology that can inhibit its adoption; this concern may be particularly important in an international, non-academic setting [7]. Our institution introduced the first robotic system in our geographic region (Central America). We reviewed our experience in implementing a training pathway for robotic urologic surgery, especially with radical prostatectomy.

Methods

In March 2012 a daVinci SI robotic system was installed at a private hospital in Panama; this was the first system installed in Central America. Our implementation pathway was comprised of:

Phase I - Introduction to da Vinci® Surgery

I. Sign up for On-line da Vinci community

II. Live Procedure Observation

Phase II – Preparation & System Training

i. da Vinci SI System on-line training. Take Assessment (Link). Printout score or sabe printscreen and email or provide certificate
Implementation of Surgery Clinical Pathway for Training in Urologic Robotic Surgery: Preliminary Experience with the Radical Prostatectomy in Central America

Results

During a 48 month period, 500 robotic-assisted laparoscopic surgeries were performed. 210 robotic prostatectomies, 31 partial nephrectomies, 20 radical prostatectomies, 4 donor nephrectomy, 17 pyeloplasties, 3 sacrocolpexias, and 1 partial cystectomy. All surgeons complete the clinical pathway solution. Mean console time for the first 8 cases, with preceptor, was 251 minutes and for the following 31 cases 110 minutes. Regarding robotic-assisted laparoscopic radical prostatectomies: patient preparation was 17 min, docking time 5.6 min, console time 150 min. Total operative time range from 2 to 5 hours (Mean 210 minutes). Mean patient age was 61. Mean PSA 8 ng/ml. Average hospitalization days: 2.7 (range 1-14d). The dominant preoperative Gleason was 3 + 3, while the predominant postoperative was 4 + 3. There were no intraoperative major complications (Table 1).

Table 1: Results for radical prostatectomy.

| Results               | n=100 |
|-----------------------|-------|
| Preoperative Gleason  | 3+3   |
| Postop Gleason        | 3+4   |
| Transfusions          | 3%    |
| Pulmonary edema       | 1%    |
| Acute renal insufficiency | 1% |
| Convulsions           | 1%    |
| Transient hydronephrosis | 2% |
| T2                    | 54%   |
| T3a                   | 26%   |
| T3b                   | 14%   |
| T3c                   | 6%    |
| Urethral stenosis     | 2%    |
| Mild incontinence (Sling) | 2% |
| Post-incisional hernia | 2% |
| Bladder Stone         | 1%    |

In the immediate postoperative period the complication rate was 5% (6/118): Two pts. Had transient hydronephrosis, one patient with a cute renal failure and another had pulmonary oedema due to fluid overload and transient cardiac failure. Two pts. Received transfusions. Positive Surgical margin rate for pT2 was 1% and 15% for pT3 cases. Continence (0 to 1 pad daily): 88%. Erectile function was present in 10% of the pts before surgery. Erectile function was present in 69% of patients, using most of them oral medications (Tadalafil or sildenafil) with a follow-up of 8 to 12 months for 73 patients. Two patients have required placement of a transobturator mesh. Other complications included...
incisional hernias, bladder stone and urethralstenosis (6% mid-term complication rate).

Conclusion

Since the advent of robotic surgery surgical special ties have received more influence than urology. Currently RALP is a technique that is firmly established in medical practice of many health centers around the world, replacing traditional open and laparoscopic technique as a standard treatment for prostate cancer [8]. However, there is a known learning curve for this technology that can inhibit its adoption. For non-academic center in Latin America, to achieve similar results can be troublesome. Patel et al. [9] published excellent results in the largest series RALP by a single surgeon. These authors reported an average of 105 min (55-300), an intraoperative bleeding of 111 cc (50-500), an average rate of 4.3% complications, a hospital stay of 24 hours and no deaths were reported. O Castillo et al. [10] reported 254 minutes in his first 25 cases, and then 189 min in his next 25, 3 conversions and a positive margin rate of 12%. H Davila et al. [11] reported an average operating time of 253.44±51.51 min (90-540), bleeding 309.8 cc (25-1500), 12.9% complications and hospitalization time of 3 days.

There are no reports of erectile disfunction for open or laparoscopic prostate surgery in Panama. Latin American results from Coelho and Davila [11] report postoperative recovery of erectile function in 94% and 54%, 18 months following robotic surgery. The outcomes are still mainly influenced by the preoperative patient characteristics and the experience of the surgeon. Our preliminary results are similar to other Latin American surgeons. Implementation of the robotic training pathway has complimented our surgical training. The pathway seems to be a valuable tool for robotics kill development to obtain competency.

Our structured clinical training program assisted in the rapid development of our robotic surgical program, and we believe was responsible for our safe and effective experience. In our institution, robotic surgery is the method of choice for treatment of localized prostate cancer. As robotic surgery continues to expand to diverse international regions and non-academic institutions, detailed protocols such as ours can aid in its successful adoption elsewhere, as well.

References

1. 2010-2014 Contraloría General de la República de Panamá: Panamá en Cifras.
2. Ficarra V, Sooriakumaran P, Novara G, Schatloff O, Briganti A, et al. (2012) Systematic review of methods for reporting outcomes after radical prostatectomy combined and proposal of a novel system: The survival, continence, and potency (SCP) classification. Eur Urol 61(3): 541-548.
3. Patel VR, Sivaraman A, Coelho RF, Chauhan S, Palmer KJ, et al. (2011) Pentafecta: A new concept for reporting outcomes of robot-assisted laparoscopic radical prostatectomy. Eur Urol 59(5): 702-707.
4. Sivaraman A, Chauhan S, Schatloff O, Palmer K, Coelho R, et al. (2011) A new concept for reporting outcomes of robot-assisted laparoscopic radical prostatectomy: The Octaecta. Eur Urol 10: 551.
5. Finkelstein J, Eckersberger E, Sadri H, Taneja SS, Lepor H, et al. (2010) Open versus laparoscopic versus robot-assisted laparoscopic prostatectomy: The European and US experience. Rev Urol 12(1): 35-43.
6. Novara G, Ficarra V, Mocellin S, Ahlering TE, Carroll PR, et al. (2012) Systematic review and meta-analysis of studies reporting oncologic outcome after radical prostatectomy robot-assisted. Eur Urol 62(3): 382-404.
7. Young M, Bodden E, Manduley A, Ruiz L. Preliminary experience with use of the da vinci SI roboticsurgery system in Panama. J of Endourology 27(1): A58.
8. Menon M, Bhadari M, Gupta N, Lane Z, Peabody JO, et al. (2010) Biochemical recurrence following radical prostatectomy robot-assisted: Analysis of 1,384 Patients with a median 5-year follow-up. Eur Urol 58(6): 838-846.
9. Patel VR, Coelho RF, Rocco B, Orvieto M, Sivaraman A, et al. (2011) Positive surgical margins after radical robotic assisted prostatectomy: A multi-institutional study. J Urol 186(2): 511-517.
10. Castillo COA, López-Poantana G, Rodríguez-Carlin A, Eudardo Landerer L, Vidal-Mora I, et al. (2011) Prostatectomía radical con el robot da Vinci, experiencia inicial en 50 casos. Rev Chir cir 63(6): 609-616.
11. Garate J, Sanchez R, Valero R, Davila H (2015) Resultados de pentafecta en prostatectomía radical robótica: primeros 100 casos en un hospital público latinoamericano. Actas Urol Esp 39(1): 20-25.