International Journal of Medical Arts 2020; 2 [4]: 718-721

Available online at Journal Website
https://ijma.journals.ekb.eg/
Main subject [Surgery[Urology]] *

A case-report

Robotic-Assisted Laparoscopic Radical Prostatectomy [RALRP] in a Patient with Sever Kyphoscoliosis, Ankylosing Spondylitis: A Case Report

Nabeel Joda Kuwaijo[a]; Mohammad Abo Elmagd[b]; Nicholas Hegarty[b]; Kiaran O'Malley[b], Thomas Lynch[b]

Department of Urology, Galway Clinic, Royal College of Surgeons, Ireland[a].

Department of Urology, Mater Misericordiae University Hospital, Dublin, Ireland[b]

Corresponding author

Nabeel Joda Kuwaijo
Email: dr_kwaijo@yahoo.com

Received at: March 31, 2020; Revised at: June 26, 2020; Accepted at: July 04, 2020

DOI: 0.21608/ijma.2020.27024.1116

ABSTRACT

Background: Anatomical abnormalities in kyphoscoliosis [KS] is a huge challenge in patient positioning for robotic prostatectomy. The narrow pelvis limits the range of movement of the robotic instruments' and port placing could be an issue. Second, carful preoperative assessment prior to administration of anesthesia and pneumoperitoneum in robot-assisted radical prostatectomy [RRP] is crucial to reduce peri-operative cardio-pulmonary complications.

The Case: We report a successful use of robot in a patient with sever kyphoscoliosis for radical prostatectomy. He was a 58 years old male, overweight, with KS and history of cardiac stenting, bilateral total hip replacement. He had prostatic carcinoma. He is on antihypertensive medications, statins and bronchodilator inhalers. Auscultation revealed bronchovascular breathing with left base inspiratory crepitation. He was Mallampati score III [difficult intubation], recurrent chest infection, and severe restriction of respiratory function. The management had been performed under general anesthesia, in the supine-Trendelenburg-Lithotomy position before engaging the robot. The operative intervention showed stability of the patient except an episode of hypertension [an hour after starting surgery]. The total operative time [3 hours, 50 minutes]; the patient then transferred to intensive treatment unit for the next 12 hours. Postoperatively, backache is absent, drain removed 24 hours later; patient discharged after 48 hours, and catheter removed 10 days later. Histological examination showed adenocarcinoma of prostate, 35% of the gland with negative surgical margin.

Conclusion: We confirmed that, robotic assisted radical prostatectomy could be handled in Kyphoscoliosis, Ankylosing Spondylitis with satisfactory outcome, irrespective of both technical and anaesthetic difficulties.

Keywords: Robotic; Radical Prostatectomy; Kyphoscoliosis; Ankylosing Spondylitis; Case report.

Please cite this article as: Kuwaijo NJ, Abo Elmagd M, Hegarty N, O'Malley K, Lynch T. Robotic-Assisted Laparoscopic Radical Prostatectomy [RALRP] in a Patient with Sever Kyphoscoliosis, Ankylosing Spondylitis: A Case Report. IJMA 2020; 2[4]: 718-721. DOI: 0.21608/ijma.2020.27024.1116.

* Main subject and any subcategories have been classified according to the research topic.

INTRODUCTION

Kyphoscoliosis is a deformity of the spine resulting in a lateral curvature of the spine, which is associated with rotation of the vertebrae and deformity of the rib cage. It is mainly idiopathic [70% of cases]. It can develop at any age but manifests clinically during periods of rapid growth. In general populations, its prevalence varies from 0.3% to 15.3% with a female preponderance [Female: male ratio 3:1][1].

Scoliosis is associated with restrictive lung disease and hypoxemia, which can lead to cardiovascular compromise. If untreated severe idiopathic scoliosis is fatal by the fifth decade because of pulmonary hypertension and respiratory failure [2-3].

Robot-assisted laparoscopic radical prostat-ectomy is widely practiced since its introduction in 2001. Its wide acceptance is due to its advantages, nerve-sparing, reduction of blood loss [and transfusion rate], low post-operative pain and shorter duration of hospital stay, when compared to open surgery[4-7]. However, it is associated with increased rate of postoperative nausea and vomiting [PONV, with its comorbidities] due to increased intra-peritoneal pressure associated with the steep Trendelenburg position and prolonged intra-peritoneal carbon dioxide insufflations. Thus, proper anesthetic management is crucial[8].

Taking the above facts into considerations and the adding challenge of scoliosis deformity, the management of our patient represented a challenging successful experience.

THE CASE

A male patient, with *Kyphoscoliosis,* ankylosing spondylitis had been presented with confirmed diagnosis of prostatic carcinoma. He was 58 years old, 163 cm length, 80 kg weight, and body mass index [BMI] 30.11kg/m^2. History revealed insertion of a cardiac stent through percutaneous coronary intervention [PCI], bilateral total hip replacement, road traffic accident [RTA] in Italy 1998 [fractured rib and collapsed left lung] and medications [anti-hypertensive, bronchodilator inhalers and statins]. There was no history of drug allergy. Our patient had past history of recurrent chest infections. Clinical evaluation revealed that, patient had coughing yellow thick sputum, stable cardiovascular system, stoke volume [SV] of 2 L, and blood pressure of 140/60[80]. The respiratory rate [RR] 12 cycle/ minute. Auscultation/Percussion revealed left base broncho-vesicular breathing with inspiratory crepitation. Heart sounds where normal [S1 S2] and no added sounds. Lab investigations yielded raised prostate specific antigen [PSA] to 7.8 [other lab investigations were within normal reference ranges]. The trans-urethral ultrasound [TRUS] prostatic biopsy reported adenocarcinoma of prostate Gleason grade 7 bilaterally.

Anaesthetic airway assessment showed a Mallampati score of III, Mallampati classification [indicating difficult intubation], the higher Mallampati score [III or IV] the more difficult intubation as well as a higher incidence of sleep apnea[9]. Also, our patient has intact dentition, examined in the pre-anaesthetic clinic for mouth opening, and a range of neck movements. Our patient was marked as ASA II-III.

The chest x-ray [CXR] and pulmonary function tests [PFT] showed a severe restrictive pattern with a forced expiratory volume 1 [FEV1] 40% of predicted, and functional vital capacity [FVC] 42% of predicted. The plane chest radiograph showed a Cobb's angle curvature of 58°[3] [figure 1] with quite sever dorsal kyphosis. There appears to be ankylosing of the dorsal spine. In addition, lung volumes were reduced bilaterally. Bronchial wall thickening and changes consistent with chronic obstructive pulmonary disease [COPD] is present bilaterally. However, heart size within the upper limits of normal.

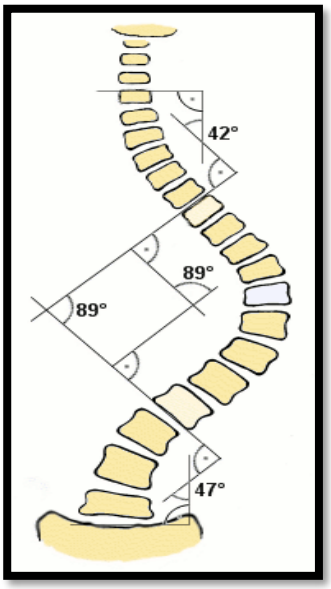

Figure [1]: Cobb angle measurement [10]

Anaesthesia

The patient shifted to the operating room where peripheral 18G cannula had been inserted. Continuous electrocardiogram [ECG], non-invasive blood pressure [right arm], and pulse oximetry monitoring had been connected. Number 8-cuffed endotracheal tube required Bougie, intermittent positive pressure ventilation [IPPV]. Eyes taped and padded so as the upper limbs. Prophylactic IV Gentamicin 240 mg and Cefuroxime 1.5 gm given on induction.

Patients was premedicated with midazolam [intravenous [IV] 0.05 mg/kg before induction of anesthesia]. Propofol and remifentanil had been concurrently infused by a target controlled infusion [TCI] system for induction and maintenance of anesthesia. Marsh et al.[11] and Minto et al.[12] models were used to control the effect site concentration for propofol and remifentanil, respectively [The effect site concentrations were kept within 2-5mcg/ml and 2-5ng/ml for propofol and remifentanil, respectively]. When the patient lost his consciousness, IV rocuronium 0.6mg/kg was used for relaxation.

The patient was then placed in the Supine-Trendelenburg-Lithotomy position before engaging the robot, where we used four head pillows and head ring with several of Pressure Relief Gel Pad and an adult Gel Chest Rolls put under the pillows fixed with Elastoplast adhesive bandage 8 CM X 2.5 [Figure 2]. Operative procedure had been completed as described elsewhere[11].

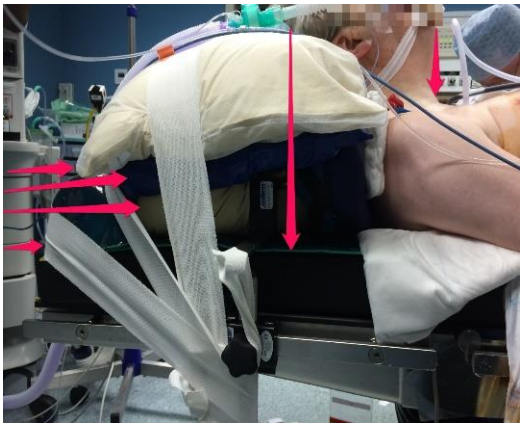

Figure [2]: Head pillows and Head ring

There was no hypotension in the perioperative period. $F1O_2$= -6, ECG= Sinus rhythm, SpO_2= 98% $ETCO_2$=7.2-7.6, ETAg= 1.3 – 1.5, Temp= 37; the highest BP 172/100 mmHg, after 1 hour and the least was in the second hour reaching 110/70 mmHg. IV Furosemide 80 mg had been given after the anastomosis.

Induction of anesthesia, positioning and skin-to-skin time was from 16:30 to 20:20; thereafter our patient had been transferred to the intensive treatment unit [ITU] for close observations and stayed for 12 hours.

Postoperatively, he did not complain of backache. Drain had been removed after 24 hours, and patient had been discharged after 48 hours to have his catheter removed in 10 days. Histopathological study reported adenocarcinoma of prostate 35% of the gland, and negative surgical margin.

DISUCSSION

Robotic surgery and every surgical procedure requires safe-skilled team; this might be particularly important in our case whom undergone RALP in spite of multiple comorbidities like severe restrictive pulmonary disease, bilateral total hip replacement, cardiac stenting [the factors made the choice of surgery for Radical Prostatectomy an important and crucial issue]. The intraoperative intra-abdominal pressure changes can worsen the respiratory function in a Kyphoscoliosis patient with restrictive lung disorder. In those patients, the morbidity and mortality both related to the preoperative respiratory functional impairment[12,13].

Anatomical variations lead to difficult endo-tracheal intubation[14]. Patients with scoliosis suffer from restrictive lung disease, which decreased vital capacity, functional residual capacity, tidal volume, and increased respiratory rate. The severity of pulmonary impairment depends on the degree of the Cobb's angle, the number of vertebrae involved, and the cephalic location of the curvature. Even if the lungs are healthy, the distortion of the thoracic cage makes the respiratory system much less compliant, and increases the work of breathing. In severe cases, displacement with rotation of the trachea and main stem bronchi may also be noted, which could cause problems during intubation for general anaesthesia[15].

In our patient, the Cobb's angle was 60° [i.e, restrictive type of pulmonary impairment with a reduced FEV1, FBC and chest wall compliance][16]. General anaesthesia when there is cardiopulmonary disease associated with severe scoliosis is associated with altered anatomy of the airway

causing difficulty in laryngoscopy and intubation. It is also associated with pulmonary hypertension and patients run the risk of increase in pulmonary artery pressures during laryngoscopy and difficult intubation. Care should be taken to avoid hypoxia, hypercapnia, acidosis, and anaesthetic gases such as nitrous oxide as they increase the pulmonary vascular resistance[17].

In the current case report, the anaesthetic management was optimal, as it had been associated with no complications. In addition, the surgical outcome was satisfactory with good patient response. Both patient and surgeons had been satisfied with the results, as all faced many challenges. However, the successful outcome compensates for the stress.

Conclusion

Although Kyphoscoliosis per se is not an absolute contraindication for robotic surgery, a careful pre-anaesthetic check is mandatory. Special attention must be directed to airway and, pulmonary and CV systems. Favourable outcome are expected if every possible care had been exerted.

Financial and Non-Financial Relationships and Activities of Interest

None

REFERENCES

1. **Pajdziński M, Młynarczyk P, Miłkowska-Dymanowska J, Białas AJ, Afzal MAM, Piotrowski WJ, Górski P.** Kyphoscoliosis - what can we do for respiration besides NIV? Adv Respir Med. **2017**;85[6]:352-358. [Doi: 10. 5603/ ARM.2017.0060].
2. **Gambrall MA.** Anesthetic implications for surgical correction of scoliosis. AANA J. **2007** Aug; 75[4]:277-85. PMID: 17711158.
3. **Kulkarni AH, Ambareesha M.** Scoliosis and anaesthetic considerations. Indian J Anaesth **2007**; 51:486-95. Available from: http://www.ijaweb.org/text.asp?2007/ 51/ 6/ 486/61185.
4. **Jung JH, Arkoncel FR, Lee JW, Oh CK, Yusoff NA, Kim KJ, Rha KH.** Initial clinical experience of simultaneous robot-assisted bilateral partial nephrectomy and radical prostatectomy. Yonsei Med J. **2012** Jan; 53[1]:236-9. [DOI: 10.3349/ymj.2012.53.1.236].
5. **van Poppel H, Everaerts W, Tosco L, Joniau S.** Open and robotic radical prostatectomy. Asian J Urol. **2019** Apr; 6 [2]: 125-128. [DOI: 10.1016/j.ajur.2018.12.002].
6. **Cao L, Yang Z, Qi L, Chen M.** Robot-assisted and laparoscopic vs open radical prostatectomy in clinically localized prostate cancer: perioperative, functional, and oncological outcomes: a Systematic review and meta-analysis. Medicine. **2019**; 98:e15770. [DOI: 10.1097/ md. 0000000000015770].
7. **Basiri A, de la Rosette JJ, Tabatabaei S, Woo HH, Laguna MP, Shemshaki H.** Comparison of retropubic, laparoscopic and robotic radical prostatectomy: who is the winner? World J Urol. **2018** Apr; 36[4]:609-621. [DOI: 10. 1007/s00345-018-2174-1].
8. **Yoo YC, Bai SJ, Lee KY, Shin S, Choi EK, Lee JW.** Total intravenous anesthesia with propofol reduces postoperative nausea and vomiting in patients undergoing robot-assisted laparoscopic radical prostatectomy: a prospective randomized trial. Yonsei Med J. **2012** Nov 1; 53 [6]:1197-202. [DOI: 10.3349/ymj. 2012.53.6.1197].
9. **Mallampati SR, Gatt SP, Gugino LD, Desai SP, Waraksa B, Freiberger D, Liu PL.** A clinical sign to predict difficult tracheal intubation: a prospective study. Can Anaesth Soc J. **1985**; 32[4]:429-34. [DOI: 10.1007/ BF03011357].
10. **Puno RM, An KC, Puno RL, Jacob A, Chung SS.** Treatment recommendations for idiopathic scoliosis: an assessment of the Lenke classification. Spine [Phila Pa 1976]. **2003** Sep 15; 28[18]:2102-14. [DOI: 10.1097/ 01. BRS. 0000088480.08179.35].
11. **Gupta SS, Martini A, Wagaskar VG, Tewari AK.** Prostate Cancer in a Patient with Giant Prostatic Hyperplasia: The Robotic Approach to a Difficult Problem. J Endourol Case Rep. **2019** Aug 30; 5[3]:99-101. [DOI: 10.1089/cren. 2019. 0024].
12. **Kakar PN, Das J, Roy PM, Pant V.** Robotic invasion of operation theatre and associated anaesthetic issues: A review. Indian J Anaesth. **2011** Jan; 55[1]:18-25. [DOI: 10.4103/0019-5049.76577].
13. **Koo CH, Ryu JH.** Anesthetic considerations for urologic surgeries. Korean J Anesthesiol. **2020** Apr; 73[2]:92-102. [DOI: 10.4097/kja.19437].
14. **Ravindra GL, Madamangalam AS, Seetharamaiah S.** Anesthesia for non-obstetric surgery in obstetric patients. Indian J Anaesth. **2018** Sep; 62[9]:710-716. [DOI: 10. 4103/ija.IJA_463_18].
15. **Bansal N, Gupta S.** Anaesthetic management of a parturient with severe kyphoscoliosis. Kathmandu Univ Med J [KUMJ]. **2008** Jul-Sep; 6[23]:379-82. [DOI: 10. 3126/kumj.v6i3.1716].
16. **Zaba R.** Pulmonary compensatory indexes in children and adolescents with idiopathic scoliosis I degree. Wiad Lek. **2003**; 56[5-6]:250-3. PMID: 14526484.
17. **Chin JWE, Stuart GM.** Anesthetic considerations for scoliosis surgery in a patient with recessive severe/lethal form of osteogenesis imperfecta. Paediatr Anaesth. **2018** Sep; 28[9]:817-818. [DOI: 10.1111/pan.13461].