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OPEN VS LAPAROSCOPIC RADICAL PROSTATECTOMY

Radu ANGHEL[1]
Ovidiu Gabriel BRATU[2]
Ana Maria Alexandra STANESCU[3]
Dan DUMITRESCU[4]
Bogdan SOCEA[5]
Dragos MARCU[6]
Alexandru CHERCIU[7]
Lucian IORGA[8]
Dan MISCHIANU[9]

ABSTRACT:
THERE ARE A FEW STUDIES WHICH LOOKED INTO THE OVERALL BENEFIT AND LONG TERM OUTCOME OF RADICAL OPEN PROSTATECTOMY VERSUS LAPAROSCOPIC PROSTATECTOMY, THE SECOND PROCEDURE BEING MORE AND MORE POPULAR WITH THE PATIENT BUT ALSO WITH THE UROLOGIST. THE PURPOSE OF THIS ARTICLE IS TO COMPARE THE BENEFITS TO THE PATIENT, THE ADVANTAGES AND DISADVANTAGES BETWEEN THIS TWO PROCEDURES REGARDING THE PROSTATE CANCER. IN MAKING THIS ARTICLE PUBMED DATABASE WAS RESEARCHED AMONG SPECIALTY LITERATURE.

KEY WORDS: PROSTATE CANCER, RADICAL PROSTATECTOMY, OPEN APPROACH, LAPAROSCOPIC APPROACH

INTRODUCTION

In recent years laparoscopic prostatectomy has increased in popularity for prostate cancer as first line of treatment. In fact in most surgical centers it took the place of the open retropubic prostatectomy. Recent studies demonstrated that laparoscopic prostatectomy has a

[1] University Emergency Central Military Hospital, Bucharest, Romania
[2] University Emergency Central Military Hospital, Bucharest, Romania; University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania; Academy of Romanian Scientists, Bucharest, Romania
[3] University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania
[4] University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania; University Emergency Hospital Bucharest, Surgery Department, Bucharest, Romania
[5] University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania; "Sf. Pantelimon" Emergency Clinic Hospital, Surgery Department, Bucharest, Romania
[6] University Emergency Central Military Hospital, Bucharest, Romania; University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania
[7] University Emergency Central Military Hospital, Bucharest, Romania
[8] University Emergency Central Military Hospital, Bucharest, Romania; University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania
[9] University Emergency Central Military Hospital, Bucharest, Romania; University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania; Academy of Romanian Scientists, Bucharest, Romania

lower chance of positive margins than the open procedure[10]. Also the expectation for the outcome are higher. Laparoscopic procedure has also it's limitation regarding the natural dexterity which is lower by the restricted manouvrability due to the instruments. Another disadvantage of this procedure is that the depthperception is compromised by the two-dimensional image. This problem is partially solved with the invention of the 3D monitor, but the costs of the equipment are higher thus not so available in every center. A different challenge regarding laparoscopic prostatectomy is represented by the rigidity and the length of the instruments resulting an exaggeration in the transmitted movements which makes delicate fine procedures like the urethro-bladder anastomosis difficult.This type of surgery was introduced in 1992 by Schuessler et al in order to reduce the morbidity of the open procedure[11]. Recent studies conducted by the National Institute for Health and Care Excellence, in England recommended radical prostatectomy to be performed to men with intermediate-risk and high-risk disease with a high long-term prospect of disease control[12]. Despite the fact that there is no conclusive evidence that recognize the superiority of the laparoscopic prostatectomy over the open procedure regarding the oncological benefit, many urological centers have invested a lot of money in laparoscopic tools, due to the low hospitalization time and the faster recovery time for the patient.

RESULTS

Ilic et al performed a Cochrane review that compared two studies on a lot of 446 randomised patients with prostate cancer. The mean PSA was 7,09 ng/ml and the prostate mean volume was 49,78 cm3. This study observed the difference between open, laparoscopic and robotic-assisted laparoscopic prostatectomy. The primary outcome showed no study regarding the prostate cancer-specific survival. The laparoscopic procedure had little to no difference regarding the urinary quality of life and the sexual quality of life. The main advantage of this procedure was the significant improvements regarding the duration of hospital stay and blood transfusion. Also the pain reported by the patient on the first day after the surgery was lower in the robotic and laparoscopic procedure that in in open prostatectomy[13].

SURGICAL TECHNIQUE

At the moment there are 3 ways to perform a radical prostatectomy: open, laparoscopic or robotic assisted. Among other type of treatment regarding prostate cancer we can mention externalbeam radiation therapy, brachytherapy, hormonal therapy and even active surveillance and watchful waiting. The main focus of this study is on the open and the laparoscopic approach for prostate cancer. The recommendation for the operation in prostate cancer is when there is a life expectancy over 10 years (EAU guideline). Bill-Axelson A et al, concluded in his study that radical prostatectomy significantly reduces the mortality in

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patients with prostate cancer, over watchful waiting[14]. Experience and careful attention to any surgical details have showed to have lower rates of positive surgical margins. Despite the fact that there is a considerable methodological uncertainty, laparoscopic prostatectomy has a reduced risk regarding the positive margins and a lower morbidity[15].

In late 1997 Schuessler et al. researched this new type of approach for the treatment of prostate cancer, where he described it as feasible, but he did not observe any difference with the open procedure, regarding the erectile function, continance, and the degree of tumor removal[16].

Regarding the pelvic lymph node dissection, Fossati, N., et al published a study where he systematically reviewed specialty literature regarding the benefits and harms of pelvic lymph node dissection and the oncological and no-oncological outcomes for the patients that underwent radical prostatectomy. He evaluated studies that considered the limited, standard, super- extended lymph node dissection and no lymph node dissections. The only main benefit for this procedure was that it provides important information regarding the prognosis and staging, information that can't be obtained by other investigations. Besides that, there is no improvement to the oncological outcome. On the contrary super-extended lymph node dissections is associated with worse intraoperative and perioperative outcome[17].To correctly stage the prostate cancer after radical prostatectomy, an extended lymph node dissection must be performed, including the lymphatic nodes in the obturator fossa over and under the obturator nerve, the nodes medial and lateral to the internal iliac artery and external iliac artery[18]. This procedure can't be performed in the classic extraperitoneal laparoscopy, but can be performed in transperitoneal laparoscopic prostatectomy and the open prostatectomy.

EAU guidelines suggested the concept of sentinel node biopsy based on the point that the sentinel node is the first station where the migrating tumor cells can reach, therefore a biopsy on this level can predict the need of lymph node dissection. However there a few studies on this biopsy, therefore it is still consider as an experiment.

Nerve-sparing surgery can be successfully performed in patients with localized prostate cancer both through the classic open prostatectomy and by laparoscopic procedure. The nerve sparing prostatectomy is more difficult laparoscopic if you don't have a 3D monitor, that allows you a better view on the nerve fibers attached to the prostate. Although it preserves the erectile function to the patient, the nerve sparing surgery must not be perform if

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there is any doubt that there can be residual tumor, or the tumor invades the neurovascular bundle[19].

COMPLICATIONS RELATED TO RADICAL PROSTATECTOMY

Among the most common and frequent complication in radical prostatectomy we can name the post-operative incontinence, post-operative urinary retention and erectile dysfunction[20]. This complication usually occurs after open radical prostatectomy. Because the technology evolved thus laparoscopic and robotic assisted laparoscopy being more and more used, studies on this subject demonstrated a rate between 89% an 100% regarding the continence rate for patients that underwent this. The mean rate of continence among patients with open retropubic prostatectomy was 80% to 97%[21].There is a lack of data regarding the potency of patients that underwent radical prostatectomy open or laparoscopic. All the studies regarding this complications showed little difference between the two types of surgery. A study performed by Haglind E et al. demonstrated that the erectile dysfunction was observed in 70.4% after robotic assisted prostatectomy and 74.7% after open retropubic prostatectomy[22].

Sinan Khadhouri et al conducted a study by using the database of The British Association of Urological Surgeons that described contemporary radical prostatectomy from all the urological centers in England over a period of 2 years. The surgical approach was robot-assisted laparoscopic in 65%,laparoscopic in 23%, and open retropubic prostatectomy in 12%. The nerve sparing procedure was performed in 57.3% of cases[23].

One of the main disadvantage in laparoscopic or robotic assisted laparoscopy is represented by the learning curve. Murat Ucar et al performed a study in Turkey where they analyzed the effect of the learning curve on the oncological outcome and complications in patients that underwent robotic-assisted laparoscopic prostatectomy. The study was conducted on a lot of 132 patients that war divided in 2 groups: the first 45 cases and the rest of the cases. The main difference in the two groups was regarding the operation time which was 250 minutes in the first group and 235 minutes in the second group which shows the importance of practice when you start to use this type of surgery. There was no notable difference between the two groups regarding potency and continence rates at 3 months and 12 months, postoperatively. Also the recovery, blood loss and hospitalization time was equal

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between the two groups. And after 12 month after the operation the continence rate was 90%[24].

DISCUSSION

Radical prostatectomy is the first line of treatment in patients diagnosed with localized prostate cancer, with a life expectancy over 10 years[25]. The main goal of the surgery even if it's performed classic open retropubic or laparoscopic and robotic assisted is to leave the patient cancer free. Surgical technique is very important regarding the oncological and functional outcome as well as the surgeons experience. With the advance of technology and the spreading of the laparoscopic approach on this type of cancer, the expectation of the patient is high regarding his quality of life (continence and erectile function)[26]. However, as any new surgical technique it has a learning curve. The laparoscopic technique permitted a more accurate precision in lymph node dissection, anastomosis and in the preservation of the neurovascular bundle[27]. To determine the learning curve for robotic assisted prostatectomy, Islamaglu et al published a study where he concluded that a number of 50 operations are required, even if the surgeon is experienced in laparoscopy[28].Moreover, the complication rates of laparoscopic radical prostatectomy is between 1.6% and 6.2%and they are dependent

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on this learning curve[29].It is very important that a surgeon is well familiar with the open procedure, because sometimes conversion is required, mainly because the complication appeared during the surgery. Among them the most frequent are bleeding, access injury and rectum injury[30]. Rectum injury is one of the most feared complication that can appear, and the literature describe this complication in 1%-2% of cases. The reason for this complication is mainly because of the prostate cancer underdiagnosed on the RM and or the adhesions after antiandrogen therapy.

The main advantage observed in many studies in using the laparoscopic approach over the open prostatectomy is the erectile function which is better preserved. The risk of injuring the neurovascular bundle is lower in laparoscopic prostatectomy. The continence rate is also a little higher in laparoscopic prostatectomy over the open procedure[31]. However there are some studies that showed there is no difference regarding the post-operative outcome between the two procedures. A study performed by Barry et al. in 2012 showed that there is no difference in continence and erectile function between the two groups in 14 months follow up[32]. In opposition with this study, Hu et al, reported that the continence and erectile function are much better after a classic open prostatectomy than a laparoscopic prostatectomy[33].

CONCLUSIONS

Both surgery techniques have its own advantage and disadvantages regarding the continence and erectile functions. Also regarding the oncological outcome all studies showed that there is no difference between the two techniques. The laparoscopic approach has the advantage of a theoretical better erectile function outcome, and the advantage that the duration of hospitalization is lower.

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