Effect of early pelvic floor muscle exercises (Kegel’s) after Robotic Prostatectomy in Prostate cancer patients

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Research Article

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Abstract

Post Prostatectomy Urinary incontinence (PPUI) due to open or robotic surgery has a negative impact on the patient's psycho-social well-being and leads to altered quality of life \[1\]. Sphincteric incompetence overall remains the primary cause of PPUI, believed due to direct damage and manipulation intraoperatively \[9\]. Pelvic floor muscle (PFM) rehabilitation appears to be beneficial at hastening return of continence \[3\]. Hence, there is a need to re-educate or strengthen the pelvic floor muscles.

Aim & Objectives: To study the return of continence, time duration required for the pelvic floor muscles to regain strength and endurance, thereby, leading to urinary continence and its effect on quality of life after Kegel's exercises on post robotic prostatectomy patients.

Methodology: Pelvic floor muscle grading, 24 hour pad test, and International Prostate symptom scoring (IPSS) had been used to assess the effect in incontinence status at 3 and 6 weeks post operatively.

Results & Analysis: 69 patients were screened between the duration of 3 year i.e. 2017-2020. 4 patients had incontinence 3 months post-surgery. Whereas, 65 patients gained continence.

Conclusion: There is an effect of early Kegel's exercise, the patients gains good pelvic floor muscle strength, show a reduction in dribbling or leakage of urine and there is an improvement in the quality of life after Robotic Prostatectomy in Prostate cancer patients after 6 weeks of surgery. 94.20 % of the patients have shown a have gained continence by 3 months post robotic prostatectomy following a regular exercise regime of Kegel's exercise.

Introduction:

Urinary incontinence is said to have a negative impact on the patient's psycho-social well-being and thus leading to a altered quality of life. Patients with prostate cancer, who undergo prostatectomy are said to have urinary incontinence immediate post-surgery. It is seen that, even after the removal of the catheter on day 10, the urinary incontinence persists. The prevalence of urinary incontinence after Robotic prostatectomy:1-87% \[1,2\]. Sphincteric incompetence overall remains the primary cause of Post Prostatectomy Incontinence (PPI), believed due to direct damage and manipulation intraoperatively \[9\]. Pelvic floor muscle (PFM) rehabilitation – appears to be beneficial at hastening return of continence \[3\]. EUA guidelines define continence following radical prostatectomy as either total control with no leakage or pad usage, no pad use but loss of few drops of urine or use of up to one “safety” pad per day. Therefore, there is a need to re-educate or strengthen the pelvic floor muscles and see the duration at which the patient gains urinary continence, which could be achieved by Kegel's exercises. Thus, there is a need to study the effect of kegel's exercises in this population.

AIM & OBJECTIVE:

1. To study the effect of kegel's exercise after prostatectomy in patients with prostate cancer.
2. To study the duration required for the pelvic floor muscles to gain strength and endurance, thereby, leading to urinary continence.

**Methodology:**

In this study, 69 patients who underwent robotic prostatectomy were included. These patients were assessed on post-operative catheter removal day, at 3 weeks and at 6 weeks. Patients who had metastasis were excluded from the study.

**ACI protocol for post prostatectomy patients:**

According to the protocol followed at Asian Cancer Hospital: Patients were mobilized out of bed and made to ambulate on immediate post-operative day 1. Later, kegel's exercise was started on day 3 which comprised of 4 exercises initially (with the catheter on direct external sphincter contraction is avoided as it may lead to reflux of urine). External sphincter muscle contraction was taught to the patients on day 10 i.e. after catheter removal. Pelvic floor muscle's fast and slow twitch contractions were taught to the patient and an advice to perform the exercises 5 times a day, with 10 repetitions of each exercise was suggested. At the 3rd week, progressions of exercise were carried on in the form of holding period. The patients were supposed to continue with the exercises for 6 weeks and note down the decrease in incontinence over this period.

*Docking of the Robot - Robotic Prostatectomy*
Exercise regime for Kegel’s exercise

Outcome measures:

Pelvic floor muscle grading, 24 hour pad test, and International Prostate symptom scoring had been used to assess the decrease in incontinence at 3 weeks and 6 weeks post operatively.

Pelvic floor muscle grading-

Laycock, has developed the Modified Oxford Grading System to evaluate the strength of pelvic floor muscles. This is a method used to manually check the pelvic floor muscle strength. It is a six-point scale: 0 = no contraction, 1 = flicker, 2 = weak, 3 = moderate, 4 = good (with lift), 5 = strong. This testing is done in the semi-fowlers position.

24 hour pad test (in gms)-

The patients were asked to wear a pad for 24 hours. Later, this pad was weighed and the weight was noted in terms of grams.

International Prostate Symptom Score (I-PSS)-

The International Prostate Symptom Score (I-PSS) is based on 7 questions concerning urinary incontinence and 1 question concerning quality of life. The urinary symptoms scoring is from 0 to 5 and can range from 0–35 (asymptomatic to symptomatic) whereas, the quality of life scoring is from 0 to 6.

Questions under urinary symptoms:
1. Incomplete emptying
2. Frequency
3. Intermittency
4. Urgency
5. Weak stream
6. Straining
7. Nocturia

The scoring is therefore divided as- 1–7: Mild, 8–19: Moderate, 20–35: Severe by the American Urology Association (AUA)

The WHO Health Organization (WHO) and the International Union against Cancer (UICC), recommends a single question for the quality of life which states 0 as delighted and 6 as terrible.

Results And Analysis:

In a total 69 patients were screened between the duration of 1 year i.e. 2017-2018 and it was observed that, 4 patients had incontinence 3 months post-surgery. On the contrary, 65 patients gained continence (Fig 1).

<table>
<thead>
<tr>
<th>Total No. of Patients (n = 300)</th>
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<tbody>
<tr>
<td>Patients studied = 69</td>
</tr>
<tr>
<td>Incontinence at 3 months = 4</td>
</tr>
<tr>
<td>Continence at 3 months = 65</td>
</tr>
</tbody>
</table>

In I, it is evident that, the patients had a pelvic floor muscle grading of 2, 3, 4 at the point of catheter removal, 3 weeks and 6 weeks follow-up post robotic prostatectomy respectively. Therefore, it is seen that at 6 weeks, the patient has a significant improvement in the pelvic floor muscle strength.

In II, it states that, the loss of urine due to incontinence using 24 hour pad test (in gms) was 72gms, 34gms, 12gms at the time of catheter removal, 3 weeks and 6 weeks follow-up post robotic prostatectomy respectively. This means that there was a reduction in the dribbling of urine which was achieved at 6 weeks which came down from 72gms to 12gms.

In III, it is seen that, the symptom scoring and quality by using International prostatectomy symptom score (IPSS) was found to be 27, 12, 6 at the time of catheter removal, 3 weeks and 6 weeks respectively. Therefore, it was seen that, there was an improvement in the quality of life and the reduction in the symptoms related to urinary incontinence.

Discussion:
It has been observed that, there is a definite degree of improvement in 92.20% (n = 65) of the patients who gained continence at a duration of 3 months. Only 5.79% (n = 4) of the patients had incontinence. The probable reason was the damage of the sphincters and the disruption of the detrusor muscles.

The study will be discussed under 3 domains:

1. Pelvic floor muscle strength
2. 24 hour pad test
3. Improvement of symptoms and quality of life

**Pelvic floor muscle strength**-

It has been noted that there was an improvement from grade 2 (weak contractions) to grade 3 (moderate contractions) at week 3 and finally up to grade 4 (good contractions) at week 6. This effective improvement in the pelvic floor muscle strength is on account of the regularity of the patient to perform exercises, the re-education of the pelvic floor muscles due to the contractions at the early phase which prevent the muscles from fatigue and disuse atrophy.

**24 hour pad test**-

The reduction in weight of the pad from 72gms at the day of catheter removal to 34gms at week 3 and in turn to 12gms at week 6 was seen as there was improvement in the pelvic floor muscle strength and thereby, the ability to control the urine and avoid it from dribbling lead to this reduction in weight. The other probable cause of this weight of pad reduction was due to the sphincter control due to increased strength of the pelvic floor muscles.

**Improvement of symptoms and quality of life**-

It was seen that, there had been a marked improvement in the symptoms from severe at the day of catheter removal to moderate to week 3 and thereby, mild symptoms at week 6. This change from severe to mild discomfort in the symptoms was due to the improvement in the symptoms such as incomplete emptying, reduction in frequency of urination, the reduction in gaping between washroom visits, the reduction in urgency to visit the washroom, improvement in the stream of urine passage, less efforts in straining while micturition and reduction in nocturia i.e. visits to the washroom at night. Also, there is improvement in the quality of life which proves to have a positive feedback and there is lesser psychosocial stress on the patient’s life. This lesser stress re-enforces the patient to perform exercises on daily basis.

**Conclusion:**

This study states that, there is an effect of early pelvic floor muscle exercises (Kegel’s exs) after Robotic Prostatectomy in Prostate cancer patients after 6 weeks of surgery. The patients gains good pelvic floor muscle strength, show a reduction in dribbling or leakage of urine and there is an improvement in the
quality of life post 6 weeks of robotic prostatectomy. It is also evident that, 94.20 % of the patients have shown a full recovery or have gained continence by 3 months post robotic prostatectomy following a regular exercise regime of pelvic floor muscle (Kegel's exercises).

Declarations:

Funding- Not applicable

Conflicts of interest/Competing interests- None

Ethics approval- Received from the Institutional ethical committee of Asian Cancer Institute, Mumbai, Maharashtra, India

Consent to participate- Retrospective study, no consent required

Consent for publication- Taken from the Institute

Availability of data and material- Yes

Code availability- Not Applicable

Authors' contributions- Both authors contributed to the study conception and design. Surgical intervention was performed by Dr. Jagdish Kulkarni. Physiotherapeutic intervention, data collection and analysis were performed by Dr. Ankita Chitre (PT). The first draft of the manuscript was written by Dr. Ankita Chitre (PT) and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

References:


Figures

Figure 1

I: Total number of patients who were screened for the Bladder control
Figure 2

II: Pelvic floor muscle grading: catheter removal, 3 weeks and 6 weeks post operatively

Figure 3
III: Urine loss due to incontinence using 24 hour pad test (in gms): catheter removal, 3 weeks and 6 weeks post operatively

![Graph showing urine loss]

Figure 4

IV: Symptom scoring and quality of using International prostatectomy symptom score (IPSS): catheter removal, 3 weeks and 6 weeks post operatively