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# ROLE OF SURGICAL TREATMENT IN PROSTATE CANCER: SUBCAPSULAR VERSUS TOTAL ORCHIECTOMY

**Mangesh Padamwar[1], Anupam Kakade[2], Dilip Gode[3], Chandrashekhar Mahakalkar[4], Ajonish Kamble[5]**

**[1,2]Assistant Professor, Dept. Of General Surgery Datta Meghe Medical College, Shalinitai Meghe Hospital and Research Centre (Datta Meghe Institute of Medical Sciences), Hingana, Nagpur-441110**
**[3]Dean, Professor, Dept. of General Surgery Datta Meghe Medical College, Shalinitai Meghe Hospital and Research Centre (Datta Meghe Institute of Medical Sciences), Higana, Nagpur-441110**
**[4]Professor, Dept. Of General Surgery Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Sawangi Meghe Wardha-442001**
**[5]Senior Resident, Dept. Of General Surgery Datta Meghe Medical College, Shalinitai Meghe Hospital and Research Centre (Datta Meghe Institute of Medical Sciences), Hingana, Nagpur-441110**

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**Abstract**

**Background:** Aim of the study is to decide which surgical treatment is better in terms of oncologic and patients functional outcome, from subcapsular or total orchiectomy. These procedures are also called as surgical castration. **Materials & Methods:** In association with Jawaharlal Nehru Medical College AVBR Hospital (Datta Meghe Institute of Medical Sciences) Sawangi (Meghe), Wardha, Maharashtra, this work was performed in the Department of General Surgery at Datta Meghe Medical College and Shalinitai Meghe Hospital and Research Centre, Hingna, Nagpur. Over a period of 1 year 75 cases of prostate cancer were included. Prostate specific antigen along with psychological status of patient in view of organ loss, all these things were recorded in postoperative period in a follow up of 3 months of surgical intervention. **Results:** Study population comprises of 75 patients of which 28 patients(37.33%)underwent total orchiectomy and 47 patients (62.66) treated with subcapsular orchiectomy.Mean of the parameters taken which suggests mean age was 71.3 years,mean preoperative PSA level was 45ng/ml . Duration of surgery was less in subcapsular type. There was no documentation of excess complication in both the groups. Both the group showed similar levels of serum PSA and serum testosterone levels after postoperative 3 months duration as compared with preoperative values but more patients give history of psychological disturbance due to feeling of organ loss as a result of total orchiectomy. **Conclusion:** In surgical treatment for prostate cancer subcapsular orchiectomy should be the preferred option because of less duration of surgery and it improves the quality of life of a patient as patient do not suffer psychological effects of organ loss. When compared in terms of oncologic outcome subcapsularorchiectomys does not show any better result as compared to total orchiectomy but it can be considered as a safe alternative to perform surgical castration.

**Keywords---** Prostae Cancer , Total Orchiectomy , Subcapsular Orchiectomy


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## INTRODUCTION

After skin cancer, malignant neoplasm of the prostate gland is commonest in males and it accounts for 28% of malignancies in male population. While the invention of prostate specific antigen (PSA) test, made it easier to diagnose the cancer of prostate gland, where 5-10% patients with this diagnosed as metastatic disease.[1]While most men are present with localized disease, at the time of diagnosis the incidence of distant metastatic disease increased. [2]When it was made clear that prostate cancer is androgen-dependant condition at that time they have started treating this with diethylstilbestrol. While the treatment modality for advanced prostate cancer patients is changing rapidly, androgen deprivation therapy (ADT) remains the cornerstone of therapy. [3,4]

Huggins and Hodges [5] illustrated total orchiectomy in 1941 andclaims that orchiectomy and estrogen were equally effective in the treatment of metastatic disease as a result of which 90% patients showed 18-34 months of progression free survival. [6]

Since 1980, chemical castration is being used by giving gonadotropin-releasing hormone (GnRH) agonists and GnRH antagonists. [7] " Flare Phenomenon" which may occur due to GnRH agonist can be prevented by administration of antiandrogen therapy which are usually used for maximal androgen blockade .The 'flare' phenomenon was first identified in patients with advanced breast cancer who were given hormonal treatment more than 35 years ago. The word 'tamoxifen flare' was applied to women who endured a temporary but serious period of increased bone pain and worsened clinical status following initiation of tamoxifen therapy for advanced breast cancer.[8]

Due to the late onset of impact and high cost of medical castration surgical castration is favored. The only reason why surgical castration is avoided is the psychological trauma caused by an empty scrotum. Keeping this as conern in 1942 ,Riba [9]first described subcapsular orchidectomy. In this procedure the tunica albuginea's outer wall is maintained and after the operation a tangible mass is left to avoid the feeling of empty scrotum.Several other techniques have been identified to address this problem, such as testicular prosthesis, complete orchiectomy, fat injection and subepididimal orchiectomy, but none have been as effective as simple subcapsular orchiectomy.

Surgical ADT was viewed as a technically minor procedure associated with a one-time expense. [8,]However, hormonal analogs have been developed and quickly adopted that interfere with the pathway of the hypothalamic – pituitary axis for serum testosterone development in gonadal form. [10,11]The creation of these medical ADT strategies allowed therapy to be interrupted, which proved to be the best strategy for people with nonmetastatic disease. [12] However, continuous lifetime ADT, in

any type, remains the standard of treatment for those with metastatic prostate cancer.[13]

**MATERIALS AND METHODS**

In association with Jawaharlal Nehru Medical College AVBR Hospital (Datta Meghe Institute of Medical Sciences) Sawangi (Meghe), Wardha, Maharashtra, this work was performed in the Department of General Surgery at Datta Meghe Medical College and Shalinitai Meghe Hospital and Research Centre, Hingna, Nagpur. Over a period of 1 year, 75 cases of prostate cancer were included. Prostate specific antigen and levels of serum testosterone along with psychological status of patient in view of organ loss, all these things were recorded in postoperative period in a follow up of 3 months of surgical intervention. Demographic features, comorbidities, preoperative metastatic status, received medications, risk of surgical anesthesia, operating time, duration of hospital stay, volumes of drainage, and complications were reported. All patients involved in the study have given informed consent to the surgery.Clinical history is taken as orientation from SNAPPS technique which provides explicit steps to the students and the responsibility of expressing their clinical reasoning, expressing uncertainities and probing the preceptor which leads to identification of the issue for self study which makes the collected data more authentic and precise. [14]

To reach the testicular tissue, we use a No. 15 scalpel in the subcapsular orchiectomy technique to make a single incision through the skin, subcutaneous layer, tunica vaginalis, and tunica albuginea. Perforating the tunica albuginea allows extrusion of the testicular parenchyma into this slight incision. The testicular tissue is then skinned using wet gauze over the tunica albuginea.Tunica albuginea is closed with 3-0 vicryl suture after achieving haemostasis with cautery. The skin is closed with disrupted 2-0 vicryl sutures without inserting a Penrose drain, and the scrotum is applied with "turban" compression dressage.We perform the traditional complete orchiectomy procedure in which an incision is made in the skin and subcutaneous tissue, then the tunica vaginalis is separated by blunt dissection from the subcutaneous tissue, and the testis is removed along with the tunica vaginalis.All operations were conducted under regional anesthesia, and all patients were postoperatively discharged within 48 hours.

After 3 months of postoperative follow-up, the PSA and total testosterone levels of the patients were assessed and asked about their psychological condition in relation to loss of organ. Outcomes of both the groups were compared. The statistical analysis was performed using the software package SPSS Windows 21.0 and the Mann-Whitney U check. The minimum degree of significance was agreed as $P<0.05$.

**OBSERVATION AND RESULTS**

75 patients of diagnosed prostate cancer were studied with various parameters.

**Table I.** Age wise distribution

| Sr No | Age In Years | No Of Patients | % |
|---|---|---|---|
| 1 | 60-70 years | 30 | 40% |
| 2 | 70- 80 years | 39 | 52% |
| 3 | More than 80 years | 06 | 8% |

Table 1 shows majority of the patients 39 (52%) belong to 7th to 8th decade of life. Mean age of presentation is 71.3 years.

**Table II.** Levels of Serum PSA in Pre-operative Period

| Sr No | Levels of Sr PSA (Pre-op) | No Of Patients | % |
|---|---|---|---|
| 1 | 2.6-4.0 ng/ml | 08 | 10.66% |
| 2 | 4.0-10.0 ng / ml | 12 | 16% |
| 3 | more than 10.0 ng / ml | 55 | 73.33% |

Table no 2 shows values of serum PSA done in preoperative period which showed significant rise indicative and confirmative for prostate malignancy.

**Table III.** Levels Of Serum PSA in Post-operative Period

| Sr No | Levels Of Sr PSA (Post-op) | Post Subcapsular Orchiectomy (No Of Pts) | Post Total Orchiectomy (No Of Pts) |
|---|---|---|---|
| 1 | 2.6-4.0 ng/ml | Nil | Nil |
| 2 | 4.0-10.0 ng/ml | 17 (22.66%) | 14 (18.66%) |
| 3 | More than 10.0ng/ml | 58 (77.33%) | 61 (81.33%) |

Table No 3 shows levels of serum PSA in post-operative period. There is no significant statistical results which indicates drastic fall in serum PSA levels following both the surgeries.

**Table IV.** Post-operative Outcome

| Sr No | Post-op Outcome Parameters | Subcapsular Orchiectomy | Total Orchiectomy |
|---|---|---|---|
| 1 | Duration Of Surgery | 27 min | 38 min |
| 2 | Same Day Discharge | 42 patients (89.36%) | 12 patients (42.85%) |
| 3 | Complications | 05 patients (10.6%) | 16 patients (57.14%) |
| 4 | Satisfaction Rate | 45 patients (95.74%) | 05 patients (17.85%) |

Table No 4 shows, post-operative outcome in terms of time taken for surgery, discharge given on the same day of surgery i.e., duration of hospital stay, occurrence of any complication and the most important factor of patients satisfaction.Time taken for surgery in both types does not show any significant difference as subcapsular procedure (Group I) is completed in around 27 minutes where as total orchiectomy (GroupII) took 38 minutes to complete. Patients in Group I does not required any drain placement after surgery but in Group II 16 patients (57.14%) out of 28 required drain placement for 24 hours postoperatively. Total 21 patients showed complications which were wound related and treated by revision surgery and wound dressings.

Follow up period of 3 months was given after which patients were asked about the recovery from operative procedure in terms of patient is “satisfied or not satisfied”, where 45 patients (95.74%) from subcapsular orchiectomy group answered as “satisfied” happy because of sensation of having testis compared to total orchiectomy group where only 05 patients (17.85%) answered as “satisfied” as these group individuals are facing psychosocial problems due to organ loss , this difference was significant statistically.

**DISCUSSION**

Antiandrogen treatment for metastatic cancer of the prostate may be done by a chemical or surgical castration. Over a scrotal incision, surgical castration is done either as complete orchiectomy or as subepididymal or subcapsular orchiectomy, because of which patient has a sensation of partially full scrotum. With the removal of the testosterone-producing parenchyma in all three procedures, they have equal efficacy in treatment. [15]Age wise distribution of patients in our study ranges from 70-80 yrs 39 patients (52%) which closely comparable with the findings by Sarkar and Bhake. [16]Although surgical castration is preferred as a cost-effective and simple treatment, its main demonstrable drawbacks include complications associated with surgical procedures and psychological trauma to the patient for

the "empty scrotum".In our work , there was no substantial difference regarding complications between patients with subcapsular orchiectomy and complete orchiectomy, and no life-threatening complications were observed.Zhang et al. reported complications rates of 3 percent and 22 percent respectively in patients undergoing subcapsular and complete orchiectomy in their study of 74 patients.[17].Similar findings were verified by Roosen JU [18]and Desmond AD [19] in their studies.

The short surgery times in patients undergoing subcapsular orchiectomy, which was not consistent with the literature, were a notable finding from our research. Roosen et al. stated that it took the subcapsular technique considerably longer to perform.We refer the difference to our surgical procedure variability. In our procedure, a single full-thickness incision is used to enter and extract the testicular parenchyma, and the layers are closed as a single piece. In comparison, Roosen performs the surgery by opening the layers one by one.

We were successful with our same-day discharge surgeries using the subcapsular technique according to the literature. Not inserting drains after surgery shortens the stay of the patient in hospital considerably. That clearly demonstrates thecost effectiveness of this procedure.

Postoperative 3 months outcome did not show any improvement in oncological parameters in both the groups. Literature advocates that both the procedures shows better oncological success if done in appropriate manner. [20]After doing orchectomy high levels of testosterone is associated with metastatic foci and adrenal production.

We interviewed the postoperative "empty scrotum" feeling in the present study, which has been addressed in the literature but is not generally asked about in patients.

During the follow-up, patients in our study were asked if they felt this anxiety, and we found that 04.25% of patients undergoing the subcapsular technique and 39.65% of those undergoing the total orchiectomy technique were not psychologically happy with the treatment. Psychological problems are reported in other studies comparing these techniques but the patients were not asked to rate their satisfaction. [18]

**CONCLUSION**

We advocate the use of our technique of doing subcapsular orchidectomy which is different from that given in literature. In our technique we use regional anaesthesia, operating time is comparatively less, no requirement of drains in postoperative period and most importantly same day discharge from hospital as a result of which this technique is much more beneficial.Complications and need for revision surgery are the drawbacks of total orchiectomy which are not there in subcapsular orchiectomy and still it gives good oncologic recovery. Most significantly, because of the sensation of a full scrotum, the subcapsular technique offers better patient satisfaction after surgery.

**Conflicts of Interest:** NIL
**Funding:** NIL

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