—Review—

Is Complete Resection of Hypertrophic Adenoma of the Prostate Possible with TURP?

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Abstract

Whether complete resection was possible with TURP was explained. A lot of adenoma remains after transurethral resection of the prostate (TURP), the other hand transurethral enucleation of the prostate (TUE) is useful for complete resection of an adenoma.
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Key words: prostatic hyperplasia, transurethral resection of prostate

For radical surgical treatments of large benign prostatic hyperplasia (BPH), open prostatectomy is chosen, while transurethral resection of the prostate (TURP) is the standard for smaller BPH. However, there is a problem of recurrence with these two surgical treatments. The rate of reoperation with TURP is high[4,5]. This is a big problem whether complete resection is possible or not.

The Radical Nature of Open Prostatectomy

Specialists have believed that an adenoma can be completely removed with open prostatectomy. However, the rate of reoperation after open prostatectomy is 4.5～7% in an 8-year period[1–2]. The cause of recurrence is sure to be due to residual adenoma, although there have been no reports of research for the amount of residual adenoma. Hiraoka reported that some adenoma was left in the prostatic bed with TURP after enucleation with open prostatectomy[3]. Some of the adenoma and false capsule were left especially in both the ends of the apex and the neck of the prostate. It is said that the false capsule contains hypertrophy tissue, so BPH may be recurred[6]. Because complete removal of the adenoma is impossible even with open prostatectomy, recurrence can not be avoided.

To Where Should the Distal End of TURP Be Resected?

The 8-year rate of reoperation for TURP is high at 15.5～16.8%[4,5]. It is said that the distal end of the resection in TURP should be stopped at the verumontanum for the risk of urinary incontinence due to external sphincter damage[7,8]. When the distal end of the resection was at the verumontanum, a part of the adenoma was left, and improvement of urination was poor[8]. According to Shah[10], with a large hyperplasia the apical portions of the adenoma project were more than 1 cm from the verumontanum, and this volume came to 10～50% of the adenoma. We recommend that the distal end of the resection should not be at the verumontanum but the Nesbit sign, which is the boundary line between the adenoma and external sphincter.

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How Deep Should Resection Be for Complete Resection in TURP?

Distinguishing the adenoma from the outer gland (peripheral zone) during TURP is necessary for complete resection of an adenoma. In general, the resection surface of an adenoma is uneven and irregular. The resection surface of the outer gland is smooth and fine granular. It is believed that the two can be distinguished and advancing up to the smooth resection surface is easy during TURP. However, it has not been confirmed whether the smooth resection surface is the outer gland of the surgical capsule or not. The smooth resection surface is not equal to the outer gland.

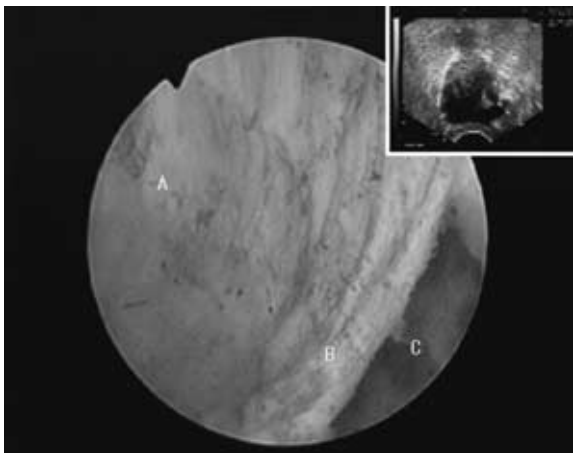

Fig. 1 Smooth and fine granular surface in margin of an adenoma, false capsule after false complete resection with TURP, the detached surgical capsule with TUE, and transrectal ultrasound image on upper right. **A**: margin of adenoma similar to the outer gland. **B**: false capsule. **C**: exposed surgical capsule with detaching blade

TUE (Transurethral Enucleation of the Prostate= Hiraoka's Detaching TURP) Developed for Complete Resection[10–12]

The author sensed a large amount of adenoma was left with TURP compared to that with open prostatectomy, and thus has worked on improvement of TURP with complete resection. Regarding TUE method, at first two thirds of the adenoma in the surgical capsule is detached from the apex towards the prostatic neck with a prostatic detaching blade attached to a resectoscope similar to enucleation of the adenoma with a finger at open prostatectomy. Then, the adenoma can be resected easily with an electric loop completely[10,12].

Could It Be Decided that the Smooth Resection Surface Is the Outer Gland?

TURP was attempted with the goal of complete resection of adenoma and resected down to a depth reaching a smooth and fine granular surface. After TURP the residual adenoma was attempted to be detached from the surgical capsule with Hiraoka's prostatic detaching blade of TUE, then the residual adenoma was resected, and the weight of that residual tissue was measured. The residual adenoma in all 64 cases were noted, and the weight and percent of residual adenoma were an average of 10.2 g ± 7.9, 54% ± 21.9 of the adenoma respectively[12]. The percent of residual adenoma was almost the same regardless of the size of adenoma. It was demonstrated that the resection surfaces at margins of an adenoma close to the surgical capsule, the false capsule, and the outer gland appeared to be smooth and fine granular. Therefore, distinguishing among the three was very difficult as the smooth resection surface was equal to the outer gland (**Fig. 1**). Thus, complete resection of adenoma is very difficult with TURP.

Other Reasons that Complete Resection Is not Possible with TURP

1. Total Prostatic Volume by Ultrasound Six Months after Surgery

Because of incomplete resection, constriction of the prostatic capsule worsens, so constriction was sure to be better with more complete resection. The average of total prostatic volume by ultrasound 6 months after three surgeries has been reported to be 8.9 ± 4.1 cm^3 with TUE[12], 46.6 cm^3 with TURP for 60 cm^3 or more prostate volume[13], and 28.4 cm^3 with holmium laser enucleation of the prostate (HoLEP)[13].

2. Remaining Prostate Volume＝Preoperative Total Prostatic Volume-Total Removed Weight

Remaining prostate volume has been reported to be 17.3±11.9 cm^3 with TUE[12], 61.1 cm^3 with TURP[13], and 28～37.38 cm^3 with HoLEP[13,14].

3. Postoperative PSA Measurement Results

With regard to PSA measurements 6 months after surgery, postoperative PSA was 0.6～0.8 ng/m*l* with TUE[11] and 1.2 ng/m*l* with TURP[15].

Conclusion

Whether complete resection is possible with TURP has been explained. This is based on the presence or absence of residual adenoma from open prostatectomy, measurement of the amount and percent of residual adenoma remaining after TURP with TUE, measurements for total prostatic volume by ultrasound 6 months after various surgeries, remaining prostate volume, and postoperative PSA measurement results. A lot of adenoma remains after TURP, so TUE is useful for complete resection of an adenoma.

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