

Experience with caudal block regional anesthesia for transurethral resection of the prostate gland.

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Summary

Ninety five consecutive patients with obstructing prostatic enlargement requiring surgery underwent caudal anesthesia for transurethral resection of the prostate gland (TURP). Their mean age was 73+/-7.8 years, the mean preoperative volume of the prostate gland was 160cc and the mean resection time was 97.3+/-30 minutes. The anesthesia was satisfactory with a mean pain score of 0.3+/-0.6 on the 0-10 pain rating scale. No complication of the anesthetic procedure occurred. Ten patients were discharged free of catheter on the same day while all the remaining 85 patients were discharged within 48 hours of surgery. It is concluded that caudal anesthesia with 2% xylocaine with 1 in 80,000 adrenaline gives adequate anesthesia for transurethral resection of the prostate gland.

Keywords: Caudal regional anesthesia, Turp.

Résumé

Quatre vingt quinze patients consécutifs avec lobliteration hypertrophie prostatique exigent d' être opéré ont passé par l'anesthésie caudale pour la résection transurethrale de la glande prostate (TURP).

Leur âge moyen était 73 +/- 7,8 ans, le moyen de la préopératoire volume de la prostate était 160cc et le moyen du temps de la résection était 97,3+/- 30 minutes.

L'anesthésie était satisfaisante avec le moyen de la douleur notée de 0,3+/- 0,6 sur le 0-10 la balance qui estime la douleur. Il n'y avait pas le cas de la complication au cours du procédé de l'anesthésie.

Dix patients étaient sortis de l'hôpital sans cathéter le même jour tandis que les autres 85 patients étaient sortis de l'hôpital en moins de 48 heures de l'opération. On peut conclure que l'anesthésie caudale avec 2% Xylocaine avec 1 en 80,000 adrénaline donne l'anesthésie adéquate pour la résection transurethrale de la prostate.

Introduction

Traditionally, transurethral resections of the prostate gland are performed under general, spinal or epidural anesthesia. Following extensive, satisfactory, yet to be published experiences with caudal block regional anesthesia with 2% xylocaine with 1 in 80,000 adrenaline for outpatient urethral dilatations and cystoscopies over the past 18 years, it was considered that since the urethra and the urinary bladder which are instrumented during urethral dilatations and cystoscopy shared the same somatic and autonomic innervations as the prostate gland from the anterior roots of the 2nd, 3rd, and 4th sacral segments of the spinal cord¹, saddle anesthesia as obtained with caudal block for urethral dilatations and cystoscopies should also be adequate for transurethral resections of the prostate gland. Although the pelvic viscera receive double innervations from the sympathetic nervous system via the hypogastric plexuses on the one hand, and from the parasympathetic nervous system via the pelvic parasympathetic outflows through the 2nd to 4th sacral nerves on the other hand, it is documented that "lesions of the cauda equina abolish pain from over distension of the bladder, but section of the hypogastric nerve is ineffective in relieving pain from the organ"¹. The experience with 95 patients who underwent caudal block regional anesthesia for transurethral resection of the prostate gland

is presented.

Patients and Method

Ninety-five consecutive patients with obstructing prostatic enlargement requiring surgery were recruited into this study. Informed consent was obtained from each patient. The age of the patients and the ultrasound measurements of their prostatic volume were noted. Pre-existing/associated medical conditions were noted. Preoperative packed cell volume (PCV), serum Na⁺, K⁺, Cl⁻, Hco₃⁻ and urea concentrations were obtained. Backup facilities for general, and spinal anesthesia were provided. Baseline blood pressure, pulse and respiratory rate were recorded and checked quarter hourly subsequently during the procedure, and an intravenous line of normal saline was set up. The patient was placed prone, the natal cleft and the adjoining areas of the gluteal region cleared with iodine and methylated spirit and draped. The sacral hiatus is identified by palpation as a bony defect lying at the apex of an equilateral triangle with a line joining the sacroiliac joints as the base. Two percent xylocaine with 1 in 80,000 adrenaline is administered aseptically at the dose of 2mg/kg, using a 21G hypodermic needle (or the needle of 21G intravenous cannula in the very obese patient) through the sacral hiatus into the sacral canal. The patient then turns to lie supine and is placed in the Lloyd Davies position for the transurethral resection of the prostate gland (TURP). Effectiveness of the anesthesia is confirmed by testing the penis, scrotum and perineum for total loss of sensation to pinprick, 5 minutes after administration of the caudal anesthesia. The patient is not sedated. Transurethral resection of the prostate was performed using a 24FR single channel resectoscope. Each patient is instructed to indicate at any time if he experienced pain. The duration of the procedure was documented. They were asked immediately postoperatively to rate the severity of the pain they experienced during the operative procedure on a 0-10 pain rating scale². Immediately postoperatively, whole blood was obtained for repeat estimations of the PCV, and electrolytes and urea concentrations. They were commenced on normal meal as soon postoperatively as they desired.

Analysis of results: Results were analyzed using the SPSS 8.0 for windows package.

Results

Ninety five patients were studied. Their ages ranged from 62 years to 104 years with a mean of 73+/-7.8 years. The preoperative ultrasound volume of the prostate gland ranged from 58cc to 390cc with a mean of 160cc. Table 1 shows the pre-existing/associated medical conditions in 26 (27.4%) patients. The preoperative PCV ranged from 34% to 42% with a mean of 38.4%. Postoperative PCV ranged from 33% to 40% with a mean of 37.2%. There was no significant difference between the mean preoperative and mean postoperative packed cell volumes (p>0.05). The mean preoperative and the mean postoperative serum Na⁺, K⁺, Cl⁻, Hco₃⁻ and urea concentrations are shown in Table 2. Though the postoperative values tended to be slightly lower than the preoperative values; this did not reach statistical significance. Resection time ranged from 45 minutes to 150 minutes with a mean of 97.3+/-30 minutes. The anesthesia was satisfactory in all the patients with a pain score of 0 in 76 (80%) patients, score of 1 in 12 (12.6%) patients, score of 2 in 7 (7.4%) patients and an overall mean pain score of 0.30+/-0.6 on the 0 to 10 pain scoring scale. No

supplementary drug was needed for anesthesia or analgesia during the operative procedure in any of the patients. No complications occurred.

Table 1 Associated medical conditions in 26 patients

Associated condition	Number of patients	%
Ca prostate	10	10.5
Diabetes mellitus	7	7.4
Stroke	2	2.1
Cataract	3	3.2
Vesical calculus	1	1.05
Inguinal hernia	3	3.2

Table 2 t-test table: compares the pre and post-operative values for serum Na⁺, K⁺, Cl⁻, Hco₃⁻, Urea and PCV.

	Pre-operative Value	Post-operative Value	N	df	t-value	p-value
Na ⁺	141+/-2.06	141+/-2.0	95	94	-1.845	>0.05
K ⁺	4+/-0.41	4+/-0.32	95	94	-1.295	>0.05
Cl ⁻	101+/-2.2	101+/-2.1	95	94	0.852	>0.05
Hco ₃ ⁻	27+/-0.3	26+/-0.9	95	94	0.964	>0.05
Urea	18+/-4.5	18+/-0.5	95	94	-1.254	>0.05
PCV	38.4+/-2.7	37.2+/-2.9	95	94	0.716	>0.05

Discussion

Transurethral prostatectomies have traditionally been performed under general, spinal or epidural regional anesthesia with the attendant manpower and material costs of the anesthesia and anaesthesia related morbidity and mortality. Caudal block regional anesthesia administered as described in this study into the sacral canal, anesthetizes both somatic and pelvic parasympathetic neuronal outflow from the anterior roots of the 2nd to 4th sacral segments of the spinal cord; in effect blocking sensory perceptions from the bladder, prostate, urethra, lower anorectum and the perineum³. It has thus been extensively used in pediatric surgery, general surgery⁴, obstetric and in urology outpatient procedures including cystoscopies, and urethral dilatations but as yet had not been used for transurethral resection of the prostate gland. In a study involving 525 patients undergoing anal procedures, Polushin et al (1998) noted that the duration of anesthesia ranged from 2.5 to 3.5 hours and could be longer if the local anesthetic was mixed with a sedative drug⁶. Although they experienced failure of the procedure in 5.2% of their patients, they did not encounter any complications and concluded that the method was simple and reliable. In this study, a deliberate effort was not made to determine when the anesthesia eventually wore off, but surgery lasted for between 120 and 150 minutes in 19 of these patients who registered a pain score 1 to 2 due to a return of the sensation of bladder distention but not pain arising from the act of resection of the prostatic tissue or coagulation of bleeding points. This discomfort arising from a sensation of urinary bladder distension by the irrigation fluid was easily taken care of by preventing bladder over distention by emptying the bladder more frequently between resections. The use of continuous flow resectoscope where available would totally prevent this group of patients from having any discomfort during the procedure. Even though more than one pass of the needle was required for successful localization of the sacral hiatus in 17 patients (17.9%), it was simple and reliable. The caudal anesthesia was successfully administered to all the patients and no complication related to the caudal anesthesia was encountered. Ten (10.5%) patients with carcinoma of the prostate had transurethral channelization. They had previously had bilateral subcapsular orchidectomy but could not regain spontaneous voiding after 3

months on catheter drainage post orchidectomy. The 7 (7.4%) diabetic patients went into detrusor failure postoperatively with chronic urinary retention and needed continuous catheter drainage for 3 weeks postoperatively before regaining spontaneous voiding. The patient with vesical calculus had optical litholapaxy and bladder washout preceding the TURP at the same sitting. The mean postoperative electrolytes and urea and PCV values were slightly lower than the mean preoperative values, but this did not reach statistical significance. This will suggest that blood loss and absorption of irrigation fluid both of which would have been expected to have a summative effect in leading to a drop in the packed cell volume were both insignificant. There was also no significant change in the electrolytes and urea concentrations suggesting that the volume of irrigation fluid absorbed during the procedure was unlikely to have been significant. It is worthy of note that since caudal block anesthesia is apparently without effect on the central nervous system, cardiovascular system, musculoskeletal system, or the gastrointestinal system, the patients are clinically stable during the anesthesia and operative procedure and can be recommenced on normal oral feeding as soon after surgery as they desired. Extensive search of the literature would seem to suggest that caudal block regional anesthesia has not been used before for transurethral resection of the prostate gland. However, the results of this study show that caudal block regional anesthesia provides excellent anesthesia for transurethral resection of the prostate gland and was safely used even in patients with associated medical conditions who would otherwise not have qualified for general or spinal anesthesia. The basis of the effectiveness of caudal regional block anesthesia could be attributed to the findings that "lesions of the cauda equina abolish pain resulting from over-distension of the urinary bladder, but section of the hypogastric nerve is ineffective in relieving pain from the organ"¹. Blocking the cauda equina as is achieved with caudal block regional anesthesia abolishes pain arising in the organs innervated by the pelvic parasympathetic outflow via the 2nd to the 4th sacral nerve roots. It is therefore recommended for use in transurethral resections of the prostate gland, especially in anesthetic high-risk patients who would otherwise not qualify for surgery. Its use will drastically reduce if not totally eliminate the mortality and morbidity associated with the use of other forms of anesthesia for this procedure.

References

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