Anorectal manometry assessment of sphincter relaxation after local-regional anesthesia with posterior perineal block

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INTRODUCTION: *Since the 1970s, in the USA, we witnessed a progressive increase of one-day surgical procedures. This attitude soon gained ground in Europe as well. In proctology, this kind of clinical approach has always been limited by the acute sensitivity of the anal- perineal area and by difficulties in attaining a complete sphincter relaxation with local anesthesia. Posterior perineal block seems to be associated with both a good pain control and an effective sphincter relaxation.*
MATERIAL AND METHODS: *Between January 2017 and January 2018, we enrolled in our study 33 patients suffering from hemorrhoidal disease. They were all subjected to posterior perineal block. We measured anal resting pressure and squeeze pressure before and after anesthesia. Measurements where taken 5 minutes before and 15 minutes after the administration of local.*
RESULTS: *We registered an average decrease of 39,2% of resting pressure and of 45,4% of squeeze pressure.*
CONCLUSIONS: *We may state that perineal posterior block, while reducing striated muscle contractile activity, also causes a relevant reduction of anal basal tone. During surgical procedures done under regional anesthesia, we experienced a good sphincter relaxation, which was comparable, if not equal, to that induced by general anesthesia. In fact, 10 to 15 minutes after performing the block you could observe the elevation of the inferior margin of the exterior sphincter and the concomitant descent of the inferior margin of the internal sphincter (coaxial dislocation).*

KEY WORDS: Anorectal manometry, Anesthesia, Local-regional, Perineal block

Introduction

Since the 1970s, in the USA, we witnessed a progressive shift towards one-day surgery, especially for the most common and simple procedures. It is estimated that 60% of all surgery, nowadays, is carried out as outpatient surgery. The same process, however more gradually, was replicated in European countries as well. In order to cope with the growing demand for health procedures, in fact, health care systems worldwide need to reduce the expenses deriving from hospital stays. In the last few years, the Italian health care system has favored informed one-day surgery, which is proven to provide relevant benefits both to the patients and to the good management of health care facilities. Day surgery is now well established, especially for hernial, vascular pathology and for minor proctologic procedures. In proctology, this approach has always been limited by the acute sensitivity of the anal- perineal region and by the difficulties in attaining a complete relaxation of the sphincterial apparatus after local anesthesia. Perineal posterior block appears to be associated both with a good pain control and with an effective sphincterial relaxation. In this study, we wanted to evaluate objectively the action of the posterior perineal block on the sphincter apparatus.

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Materials and Methods

From January 2017 to January 2018 we enrolled in our study 33 patients suffering from third and fourth degree hemorrhoidal disease. 18 of them were male and 13 were female. Average age was 48.6 years, ranging between 38 and 60 years. The average BMI was 27 kg/m^2, ranging between 24 and 31 kg/m^2. The average ASA score was 2 [1-3]. On all patients, we performed a perineal posterior block, according to our own variant of Marti's technique [1,2]. Together with the anesthesia of the deep and superficial plan we also infiltrated the submucosal tissue of the anal channel right above the pectinate line. The anesthetic preparation was made of 60 ml of 0,5% Lidocaine buffered with sodium bicarbonate 1 M and 1:200000 epinephrine. We registered anal resting and squeeze pressure both before and after anesthesia. Measurements were taken in lithotomy position, 5 minutes before and 15 minutes after performing the administration of the local anesthetic. For measurements, we used 6 lumen polyethylene balloon catheter with three linear sensors at 5 mm intervals and 3 radial sensors at 120 degree intervals. The balloon was gradually distended with distilled solution at a constant rate of 0.5 ml/min (Table I).

Results

We found an average resting pressure of 73 mmHg (ranging between 53 and 110 mmHg) before the anesthesia. The same dropped at an average of 45 mmHg (ranging between 20 and 80 mmHg) 15 minutes after posterior perineal block. Average reduction of resting pressure was 39.2%. The average squeeze pressure was 151 mmHg (ranging between 125 and 220 mmHg) before the anesthesia and 84 mmHg (ranging between 28 and 125 mmHg) after the anesthesia. The average reduction in squeeze pressure was 45.4% (Table II).

TABLE I - *Population*

	N° Pazienti 33 (18 maschi - 15 femmine)
Età media	48,6 years (38-60 years)
Bmi	27 kg/m^2 (24-31 kg/m^2)
ASA score	2 (1-3)

TABLE II - *Results*

Average resting pressure before perineal block	73 mmhg (53-110 mmhg)
Average resting pressure 15' after perineal block	45 mmhg (20-80 mmhg)
Average squeeze pressure before perineal block	151 mmhg (125-220 mmhg)
Average squeeze pressure 15' after perineal block	84 mmhg (28-125 mmhg)
Average resting pressure reduction	39,2%
Average squeeze pressure reduction	45,4%

Discussion

The advancement of anesthetic techniques allows to carry out even advanced and complex proctologic procedures as day surgery, especially when the patients receive an adequate assessment and preparation [3-5]. In this context, neural-axial block techniques have gained an important role. The more frequently used among these techniques are spinal anesthesia with selective perineal block and caudal anesthesia. In the 1950s Schneider and Salvati carried out the first hemorrhoidectomies under local anesthesia. The mere infiltration of the anal region, however, presents relevant limitations: a suboptimal and often short-lived pain control and a insufficient relaxation of the sphincterial apparatus. In 1976 Marti proposed a new anesthetic technique that could be applied to proctologic surgery: the posterior perineal block. This new technique is a kind of local-regional anesthesia that can be performed by the surgeon himself and that consists in a troncular nerve block of the posterior perineal nerves and in a dermal and hypodermal infiltration of the nervous terminations leading to the anal margin [6-8]. The sphincterial apparatus is characterized by the joint presence terminations from both the somatic and autonomic nervous system. The exterior sphincter, in fact, is innervated by the posterior branches of the interior pudendal nerve and by the inferior hemorrhoidal nerve. The internal sphincter is innervated by branches of the autonomic nervous system. The manometric parameters that we choose to consider in this study reflect the activity of the two muscular components: the tone of the smooth muscle of the internal anal sphincter is responsible for 80% of the resting pressure, while the squeeze pressure is determined by the contractile activity of the striated external sphincter [9]. Therefore, the pudendal nerve block could be expected to cause a marked reduction of contractile activity while only marginally decreasing basal pressure [10]. In our experience, we not only registered an important decrease of squeeze pressure, but also a significant reduction of basal pressure with a decrease of approximately 40% for both values. The reduced basal tone makes identification of anatomical plans easier and allows to operate more easily in the upper zone of the inferior anal channel. This proves useful in many procedures, including those involving the use of mechanical staplers, and allows to operate under a good pain control and in complete safety.

Conclusions

We can state that the posterior perineal block not only reduces the striated muscle contractile activity but also the smooth muscle basal tone. Therefore, this technique appears to act on both the somatic and the autonomic terminations that reach the sphincterial apparatus through the ischioanal fossae. During proctologic procedures done under local regional anesthesia with posterior perineal block we registered a marked reduction of the tone of the muscular wall of the anus, which was comparable, in not equal, with that induced by general anesthesia. Moreover, 10-15 minutes after performing the anesthesia you could observe the elevation of the inferior margin of the exterior sphincter and the concomitant descent of the inferior margin of the internal sphincter (coaxial dislocation). Therefore, this technique appears to act on both the somatic nerves that reach the striated muscle and on the autonomic terminations reaching the smooth muscle. This allows for a greater ease in the execution of proctologic interventions as one-day surgery, with all the benefits we mentioned above on both health expenses and patients satisfaction [11-13].

Riassunto

Introduzione: A partire dagli anni 70 negli Stati Uniti si è assistito ad un progressivo aumento delle procedure chirurgiche in day surgery Questo processo si è diffuso anche nella maggior parte delle strutture sanitarie in Europa. In ambito proctologico le indicazioni sono sempre state limitate dalla particolare sensibilità della zona ano-perineale e da un difficile completo rilassamento dell'apparato sfinteriale dopo anestesia locale. Il blocco perineale posteriore sembra essere associato oltre che ad una buona analgesia ad un efficace rilassamento sfinterico.
Materiali e Metodi: Da gennaio 2017 a gennaio 2018 sono stati arruolati 33 pazienti affetti da patologia emorroidaria. In tutti i pazienti è stato eseguito un blocco perineale posteriore. Sono state misurate la pressione basale del canale anale e la contrazione massima volontaria prima e dopo l'anestesia. Le due rilevazioni manometriche sono avvenute in posizione litotomica 5 minuti prima e 15 minuti dopo l'esecuzione dell'anestesia.
Risultati: La diminuzione media del tono basale dopo blocco perineale posteriore è stata pari al 39,2% e la riduzione media della contrazione massima è stata del 45,4%.
Conclusioni: Possiamo affermare che il blocco perineale posteriore determina oltre alla riduzione dell'attività contattile della muscolatura striata, anche un rilevante decremento del tono anale di base. Durante interventi proctologici eseguiti in anestesia locoregionale con il blocco perineale posteriore si è riscontrato notevole rilasciamento della parete sfinteriale dell'ano paragonabile, anche se non uguale, a quello che si verifica durante un'anestesia generale. Infatti dopo circa 10-15 minuti nella quasi totalità dei casi si osserva sia la risalita del margine inferiore dello sfintere esterno che la concomitante discesa del margine inferiore dello sfintere interno (dislocazione coassiale).

References

1. Marti MC: *Local anesthesia in proctology.* Nouv Presse Med, 1976; 5(32):2075-77.

2. Gabrielli F, Cioffi U, Chiarelli M, Guttadauro A, De Simone M: *Hemorrhoidectomy with posterior perineal block: Experience with 400 cases.* Dis Colon Rectum, 2000; 43(6):809-12.

3. Maternini M, Guttadauro A, Pecora N, Gabrielli F: *Perineal stapled prolapse resection (PSPR) for external rectal prolapse in high morbidity patients.* Ann Ital Chir, 2016; 87:476-80.

4. Guttadauro A, Chiarelli M, Maternini M, Baini M, Pecora N, Gabrielli F: *Value and limits of stapled transanal rectal repair for obstructed defecation syndrome: 10 years-experience with 450 cases.* Asian J Surg, 2018; 41(6):573-77. doi: 10.1016/j.asjsur 2017.05.002. Epub 2017 Jul 8.

5. Gabrielli F, Macchini D, Guttadauro A, Frassani S, Bertolini A, Giussani C, DE Simone M, Cioffi U: *Psyllium fiber vs. placebo in early treatment after STARR for obstructed defecation: A randomized double-blind clinical trial.* Minerva Chir, 2016; 71(2):98-105. Epub 2015 Sep 1.

6. Kushwaha R, Hutchings W, Davies C, Rao NG: *Randomized clinical trial comparing day-care open hemorrhoidectomy under local versus general anesthesia.* Br J Surg, 2008; 95(5):555-63.

7. Lacerda-Filho A, Cunha-Melo JR: *Outpatient hemorrhoidectomy under local anaesthesia.* Eur J Surg, 1997; 163(12):935-40.

8. Nyström P, Derwinger K, Gerjy R: *Local perianal block for anal surgery.* Tech Coloproctol, 2004; 8(1):23-26.

9. Shafik A: *A new concept of the anatomy of the anal sphincter mechanism and the physiology of defecation. The external anal sphincter: a triple-loop system.* Invest Urol, 1975; 12(5):412-19.

10. Frenckner B, Euler CV: *Influence of pudendal block on the function of the anal sphincters.* Gut, 1975; 16(6):482-89.

11. Palumbo P, Perotti B, Amatucci C, Pangrazi M, Leuzzi B, Vietri F,Illuminati G: *Perceived quality in Day Surgery Units Proposal of an enquiry postoperative questionnaire.* Ann Ital Chir, 2014; 85: 172-76.

12. Vinson-Bonnet B, Higuero T, Faucheron JL, Senejoux A, Pigot F, Siproudhis L: *Ambulatory haemorrhoidal surgery: Systematic literature review and qualitative analysis.* Int J Colorectal Dis, 2015; 30(4):437-45. doi: 10.1007/s00384-014-2073-x. Epub 2014 Nov 28. Review.

13. Kulkarni SV, Agarwal P, Nagraj K: *To compare the outcome of minor anorectal surgeries under local anesthesia versus spinal anesthesia.* Indian J Surg, 2014; 76(5):343-49. doi: 10.1007/s12262-012-0693-3. Epub 2012 Jul 15.