

ORIGINAL PAPER

Altieri modified Nesbit corporoplasty for the treatment of penile curvature: Comparison of local anesthesia vs loco-regional anesthesia on the clinical outcomes

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Summary *Objective: To compare the safety profile and clinical outcomes of Altieri-modified Nesbit corporoplasty using two different anesthesia methods including spinal anesthesia and local anesthesia.*

Materials and methods: A total of 40 patients with congenital penile curvature (CPC) and Peyronie's disease (PD) underwent Altieri-modified Nesbit corporoplasty. Group 1 (n = 20) received spinal anesthesia, and Group 2 (n = 20) received local anesthesia. The patients were categorized into age groups (< 30 years, 31-45 years, 46-60 years, and 61-75 years) for analysis.

Clinical outcomes, post-operative complications, hospital stay, pain levels, and other parameters were assessed.

Results: The results showed that 2 patients (10%) reported post-operative complications, including headache, arterial hypotension, and penile foreskin necrosis from the spinal anesthesia group. Whereas, in the local anesthesia group, 1 patient (5%) reported scar phimosis. Further, post-operative pain was predominantly very mild, with 16 patients (80%) in the spinal anesthesia group and 14 patients (70%) in the local anesthesia group experiencing minimal discomfort. Age did not significantly impact hospital stay, post-operative intestinal disorders, constipation, lower urinary tract symptoms, voiding burning, or dysuria.

Conclusions: Spinal anesthesia may lead to more post-operative complications and longer hospital stays compared to local anesthesia. Age does not significantly affect most clinical outcomes but can influence post-operative pain in patients receiving local anesthesia.

KEY WORDS: Penile curvature; Altieri-modified Nesbit corporoplasty; Spinal anesthesia; Local anesthesia; Peyronie's disease.

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INTRODUCTION

Congenital penile curvature (CPC) is a rare condition with an incidence of less than 1% (1). Peyronie's disease (PD) is a fibrotic disorder of the tunica albuginea of the penis characterized by the presence of fibrotic plaques often leading to penile deformity, with or without concomitant

pain. Men with PD are most commonly present in their sixth decade of life, with a mean age of 52-57 years old (2-5). PD impacts sexual function and is also associated with psychosocial distress in patients and their partners. Once thought to be rare, PD now has a reported prevalence of up to 20.3% in adult men (6) whose conservative treatment is usually successful during the active phase (7). Treatment of PD utilizes both medical and surgical approaches and includes a diverse group of systemic and locally administered drugs. Approaches to PD have included observation, small molecule and biologic drugs administered orally, topically, and intralesionally, mechanical therapies, and surgery. Counseling and observation alone may be appropriate for patients with minimal curvature that does not impede sexual intercourse and with no erectile dysfunction (ED) (8); other patients will elect to proceed with treatment. If the curve in the penis continues during the stable phase and plaques are completely stabilized, surgery is generally the best treatment, mainly if there are problems with having sexual intercourse (9). Orally treatments with vitamin E, potassium para-aminobenzoate and tamoxifen have been used in the initial phase with low success rates (10). Penile shortening procedures are used when the curvature is less severe and include the Nesbit wedge resection and the plication techniques performed on the convex unaffected side of the penis. Penile lengthening procedures are performed on the concave side of the penis and require the use of a graft (11-14). Altieri modified Nesbit corporoplasty avoids intraoperative use of tourniquet without risk of bleeding, to reduce penile ischemic anatomical and functional damages such as long-term erectile dysfunction (15).

Surgical procedures can be performed under local block anesthesia, general, or regional anesthesia.

The choice of anesthetic technique has a major impact on how the patient responds during the postoperative period. Local anesthesia is cheaper, avoids the hazards of general or spinal anesthesia, and may be the only option in patients in whom general/spinal anesthesia is deemed too

risky. Regional anesthesia has been increasingly employed in the outpatient setting, given its unique characteristics of selectivity and efficacy in the control of acute postoperative pain. Outpatient regional anesthesia economic externalities have been investigated by some studies, which have associated its systematic adoption with a decrease in anesthesia-controlled operating room time and thus in the operating room fixed costs, potentially translating into a significant increase in patient turnover and ultimately hospital revenues (16, 17). However, some patients may not get complete pain relief from local block anesthesia. Spinal anesthesia has been shown to decrease postoperative pain after inguinal herniorrhaphy when compared with general anesthesia; local anesthesia has been shown to reduce hospital time, lower the cost of treatment, and has no or fewer side effects compared with spinal and general anesthesia (19, 20). Little information is available on the use of local anesthesia and loco-regional anesthesia on the clinical outcomes of Peyronie's disease and congenital penile curvature. Therefore, present study, was to compare the safety profile and the outcomes of spinal and local anesthesia for surgical treatment of Peyronie's disease and congenital penile curvature.

METHODS

Study design

The present study compared the clinical outcomes of two groups of patients undergoing Altieri-modified Nesbit corporoplasty for the treatment of penile curvature using local vs loco-regional anesthesia. Group 1 consists of 20 patients with an age ranging from 17 to 71 years who underwent surgery under spinal anesthesia between January 2010 and March 2019. While Group 2 consists of 20 patients with an age range from 18 to 68 years who underwent surgery under local anesthesia between January 2010 and March 2019. The comparison of patients' clinical outcomes was also studied based on different age groups (< 30 years, 31-45 years, 46-60 years, 61-75 years) and with respect to local vs loco-regional anesthesia. All patients underwent surgery using the same adapted Nesbit method and had a year-long following evaluation. A short-term post-operative assessment was performed every week to look for any early complications until the incision had fully healed.

Inclusion and exclusion criteria

In this research, patients with Peyronie's disease and congenital penile curvature were included. Patients who didn't improve after taking their medications were treated with prosthesis insertion and were left out of the research. Another criteria for exclusion was the existence of complex penile curvatures (PC) in patients, which required elongation operations involving plaque incision and bovine pericardial grafting to fill the albuginea defect. Additionally, patients with follow-ups of less than 12 months were excluded from the study.

Ethical approval

The "G. D'Annunzio" University of Chieti and Pescara (01/26-01-2017) and the Ethics Committee for Biomedical Research of the districts of Chieti and Pescara authorized the

research, which was carried out in line with the Declaration of Helsinki (revised in 2013). All patients provided documented, fully informed consent.

Clinical outcomes

Following a year of monitoring, a thorough physical examination was conducted among both the treatment groups, including assessments of the degree of full straightness, remaining curvature ($> 15^\circ$), penile shortening, and a visible suture knot. Additionally, patient happiness, erectile performance as measured by the IIEF-5, and penile Doppler ultrasonography were also assessed. We used five questions to gauge patient happiness, asking respondents to indicate their degree of satisfaction on a scale from "very dissatisfied" to "very satisfied" (21). Clinical outcome was evaluated by the change in ED and penile vibratory stimulation (PVS) along with the severity at the baseline and the end of the study. The comparison of clinical outcomes among local vs loco-regional anesthesia groups was done through post-operative complications, along with hospital stay, post-operative pain, constipation, intestinal disorders, bladder catheterization, lower urinary tract symptoms, voiding burning and dysuria.

Statistical analysis

The clinical outcomes for both groups were analyzed considering $p \leq 0.05$ as statistical significance and analyzing the results with the SPSS software (Version 25.0, SPSS Inc., Chicago, IL, USA).

RESULTS

The evaluation of patients undergoing Altieri-modified Nesbit corporoplasty for the treatment of penile curvature in spinal anesthesia and local anesthesia groups showed that 2 patients who were given spinal anesthesia and 4 patients who were given local anesthesia were in a group with less than 30 years of age. Three patients for each type of anesthesia were found in the age group of 31-45 years. In the age group 46-60 years, six and seven patients were given spinal and local anesthesia respectively. In the age group 61-75 years, nine and six patients were given spinal and local anesthesia respectively. Data are presented in Figure 1.

Figure 1.

Age distribution of patients with penile curvature in spinal anesthesia and local anesthesia groups,

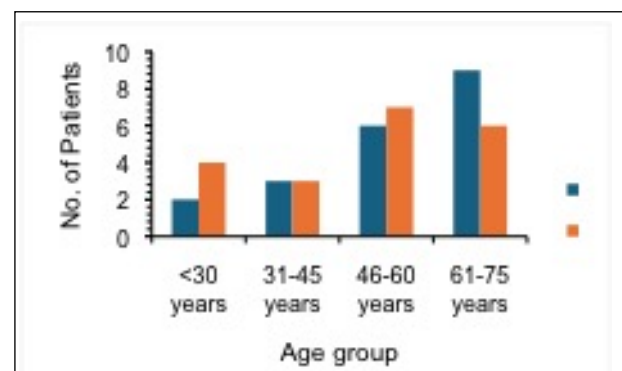
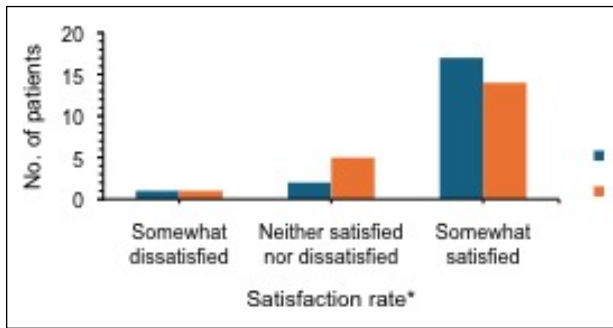


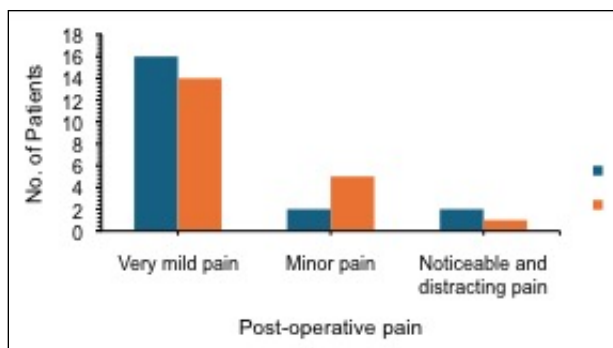
Figure 2.
The satisfaction rate of patients with penile curvature in spinal anesthesia and local anesthesia groups.



*Satisfaction was self-assessed by patients using a 5-point rating scale, with a score of 1 indicating very dissatisfied and 5 indicating very satisfied.

Two of the patients in the spinal anesthesia group reported post-operative complications, one had headache and arterial hypotension while the second had penile foreskin necrosis. Only one patient in the local anesthesia group reported scar phimosis as post-operative complication. The results showed only one patient from each group was somewhat dissatisfied with the procedure, while 2 from the spinal anesthesia group and 5 from the local anesthesia group were neither satisfied nor dissatisfied. On the other hand, 17 from the spinal anesthesia group and 14 from the local anesthesia group were somewhat satisfied with the procedure as presented in the Figure 2. However, Pearson chi-square showed a non-significant difference ($p = 0.455$) among the treatment groups. The results also showed that one patient from the local anaesthesia group and two patients from spinal anaesthesia group showed noticeable and distracting pain, while, 2 from the spinal anesthesia group and 5 from the local anesthesia group showed minor pain. On the other hand, 16 from the spinal anesthesia group and 14 from the local anesthesia group were having very mild pain as presented in Figure 3. However, Pearson chi-square showed a non-significant difference ($p = 0.416$) among the treatment groups. Other clinical outcomes were not significantly different between spinal and local anesthesia groups, including penile shortening, post-operative intestinal disorders, post-

Figure 3.
Post-operative pain among patients with penile curvature in spinal anesthesia and local anesthesia groups.



operative constipation, post-operative lower urinary tract symptoms, voiding burning, and dysuria. Hospital stay and post-operative bladder catheterization showed significant differences between spinal anesthesia and local anesthesia groups as shown in Table 1. There was a non-significant difference ($p = 0.964$) in penile shortening when spinal and local anesthesia groups were compared. There was no shortening in 35% and 30% of the patients given local anesthesia and spinal anesthesia, respectively. Only 5% of the patients from each group showed 0.5 cm shortening in penile length. In the spinal anesthesia group, 30%, 20%, and 15% of patients showed penile shortening of 1.0, 1.5, and 2.0 cm, respectively. Similarly, 20%, 25%, and 15% of patients in the local anesthesia group showed penile shortening of 1.0, 1.5, and 2.0 cm, respectively (Table 1). There was a significant difference ($p = 0.000$) in length of hospital stay when comparing spinal and local anesthesia groups, as 100% of the patients had to stay in the hospital after the procedure in the spinal anesthesia group while none after the procedure in local anesthesia group (Table 1). The chi-square test showed non-significant difference ($p = 0.147$) in post-operative intestinal disorders and post-operative constipation when comparing patients in spinal and local anesthesia groups. Only 10% of the patients who showed post-operative intestinal disorders and post-operative constipation were given spinal anes-

Table 1.
Clinical outcomes among patients with congenital penile curvature in spinal anesthesia and local anesthesia groups.

Variables	Frequency (%)		P-value**
	Spinal anesthesia	Local anesthesia	
Penile shortening (cm)			0.964
0.0	6 (30%)	7 (35%)	
0.5	1 (5%)	1 (5%)	
1.0	6 (30%)	4 (20%)	
1.5	4 (20%)	5 (25%)	
2.0	3 (15%)	3 (15%)	
Hospital Stay			0.000
Yes	20 (100%)	0 (0%)	
No	0 (0%)	20 (100%)	
Post-operative intestinal disorders			0.147
Yes	2 (10%)	0 (0%)	
No	18 (90%)	20 (100%)	
Post-operative constipation			0.147
Yes	2 (10%)	0 (0%)	
No	18 (90%)	20 (100%)	
Post-operative bladder catheterization			0.000
Yes	20 (100%)	0 (0%)	
No	0 (0%)	20 (100%)	
Post-operative lower urinary tract symptoms			0.147
Yes	2 (10%)	0 (0%)	
No	18 (90%)	20 (100%)	
Voiding burning			0.311
Yes	1 (5%)	0 (0%)	
No	19 (95%)	20 (100%)	
Dysuria			0.311
Yes	1 (5%)	0 (0%)	
No	19 (95%)	20 (100%)	

** Pearson Chi-Square.

thetia while none of the patients showed any intestinal disorder from local anesthesia group (Table 1).

There was a significant difference ($p = 0.000$) in post-operative bladder catheterization rate when comparing spinal and local anesthesia groups, as 100% of the patients had post-operative bladder catheterization in the spinal anesthesia group while none of the patients had it in local anesthesia group (Table 1).

The results showed non-significant difference ($p = 0.147$) in post-operative lower urinary tract symptoms when comparing patients in spinal and local anesthesia groups. Only 10% of the patients in the spinal anesthesia group showed post-operative lower urinary tract symptoms while none of the patients showed post-operative lower urinary tract symptoms in the local anesthesia group (Table 1).

The results showed also non-significant difference ($p = 0.311$) in burning at voiding and dysuria when comparing patients in spinal and local anesthesia groups. Only 5% of the patients in the spinal anesthesia group showed burning at voiding and dysuria while none of the patients showed such symptoms in the local anesthesia group (Table 1).

The age group comparison of the length of hospital stay showed that among patients of spinal anaesthesia group having age less than 30 only two had to stay in hospital while in age group 31-45 years, three patients had a hospital stay. In group 46-60 years, six patients have hospital stay while, in group 61-75 years, nine patients have a hospital stay. On the other hand, none of the patients from local anaesthesia group stay in the hospital. There was a non-significant difference ($p = 0.719$) among age groups for hospital stay as shown in Table 2.

In the age group less than 30 years given spinal anaesthesia, only 2 patients had very mild post-operative pain, whereas, in group 31-45 years, three patients had very mild pain. Similarly, in age group 46-60 years, four patients had very mild pain, one had minor, and one had noticeable and distracting pain. In group 61-75 years, seven patients had very mild pain, one had minor pain, and one had noticeable and distracting pain. There was non-significant ($p = 0.925$) difference among the age groups. On the other hand, among age group less than 30 years given local anaesthesia, four patients had very mild pain and in age group 31-45 years, three patients had minor pain. In age group 46-60 years, six patients had very mild pain and one had minor pain. In age group 61-

Table 2.
Pearson Chi-Square test for the relation of age groups with anaesthesia types and hospital stay.

Anesthesia type	Age group	Hospital stay		Pearson Chi-Square
		No	Yes	
Spinal anesthesia	< 30 years	0	2	0.719
	31-45 years	0	3	
	46-60 years	0	6	
	61-75 years	0	9	
Local anesthesia	< 30 years	4	0	
	31-45 years	3	0	
	46-60 years	7	0	
	61-75 years	6	0	

Table 3.
Pearson Chi-Square test for the relation of age groups with anaesthesia types and post-operative pain.

Anesthesia type	Age group	Post-operative pain			Pearson Chi-Square
		Very mild	Minor	Noticeable and distracting	
Spinal anesthesia	< 30 years	2	0	0	0.925
	31-45 years	3	0	0	
	46-60 years	4	1	1	
	61-75 years	7	1	1	
Local anesthesia	< 30 years	4	0	0	0.037
	31-45 years	0	3	0	
	46-60 years	6	1	0	
	61-75 years	4	1	1	

75 years, four patients had very mild pain, one patient had minor pain and one had noticeable and distracting pain. There was a significant difference ($p = 0.037$) among age groups given local anaesthesia for post-operative pain (Table 3).

The results of age group comparison for the post-operative intestinal disorder in patients given spinal anaesthesia showed that there were only two patients in age group 61-75 years had post-operative intestinal disorder. None of the patients in other age groups have such disorder. On the other hand, there was no patients having post-operative intestinal disorder in local anaesthesia group. The Pearson chi-square test showed a non-significant ($p = 0.438$) difference for post-operative intestinal disorder by type of anaesthesia and age (Table 4).

Table 4.
Pearson Chi-Square test for the relation of age groups with anaesthesia types and post-operative intestinal disorder.

Anesthesia type	Age group	Post-operative intestinal disorder		Pearson Chi-Square
		No	Yes	
Spinal anesthesia	< 30 years	2	0	
	31-45 years	3	0	
	46-60 years	6	0	
	61-75 years	7	2	
Local anesthesia	< 30 years	4	0	
	31-45 years	3	0	
	46-60 years	7	0	
	61-75 years	6	0	

The results of age group comparison for the post-operative constipation in patients given spinal anaesthesia showed that there were only two patients in age group 61-75 years who were having post-operative constipation however, none of the patients in other age group have such disorder. On the other hand, there was no patients having post-operative constipation in local anaesthesia group. The Pearson Chi-Square test showed a non-significant ($p = 0.438$) difference among anaesthesia, age groups and post-operative intestinal disorder (Table 5).

The results of age group comparison for post-operative bladder catheterization rate in patients given spinal anaesthesia showed that 2, 3, 6 and 9 patients in age groups < 30 years, 31-45 years, 46-60 years and 61-75

Table 5.
Pearson Chi-Square test for the relation of age groups with anesthesia types and post-operative constipation.

Anesthesia type	Age group	Post-operative constipation		Pearson Chi-Square
		No	Yes	
Spinal anesthesia	< 30 years	2	0	0.438
	31-45 years	3	0	
	46-60 years	6	0	
	61-75 years	7	2	
Local anesthesia	< 30 years	4	0	
	31-45 years	3	0	
	46-60 years	7	0	
	61-75 years	6	0	

years respectively, had post-operative bladder catheterization. None of the patients in the local anaesthesia group have post-operative bladder catheterization. There was non-significant ($p = 0.719$) difference for post-operative bladder catheterization by type of anaesthesia and age (Table 6).

The results of age group comparison for the post-operative lower urinary tract symptoms in patients given spinal anaesthesia showed that there was only one patient in age group 31-45 years and one patient in age group 46-60 years showing post-operative lower urinary tract symptoms. None of the patients in the local anaesthesia group have post-operative lower urinary tract symptoms. There was non-significant ($p = 0.343$) difference for lower urinary tract symptoms by type of anaesthesia and age (Table 7).

Table 6.
Pearson Chi-Square test for the relation of age groups with anaesthesia types and post-operative bladder catheterization.

Anesthesia type	Age group	Post-operative bladder catheterization		Pearson Chi-Square
		No	Yes	
Spinal anesthesia	< 30 years	0	2	0.719
	31-45 years	0	3	
	46-60 years	0	6	
	61-75 years	0	9	
Local anesthesia	< 30 years	4	0	
	31-45 years	3	0	
	46-60 years	7	0	
	61-75 years	6	0	

Table 7.
Pearson Chi-Square test for the relation of age groups with anesthesia types and post-operative lower urinary tract symptoms.

Anesthesia type	Age group	Post-operative lower urinary tract symptoms		Pearson Chi-Square
		No	Yes	
Spinal anesthesia	< 30 years	2	0	0.343
	31-45 years	2	1	
	46-60 years	5	1	
	61-75 years	9	0	
Local anesthesia	< 30 years	4	0	
	31-45 years	3	0	
	46-60 years	7	0	
	61-75 years	6	0	

Table 8.
Pearson Chi-Square test for the relation of age groups with anaesthesia types and voiding burning.

Anesthesia type	Age group	Voiding burning		Pearson Chi-Square
		No	Yes	
Spinal anesthesia	< 30 years	2	0	0.438
	31-45 years	3	0	
	46-60 years	5	1	
	61-75 years	9	0	
Local anesthesia	< 30 years	4	0	
	31-45 years	3	0	
	46-60 years	7	0	
	61-75 years	6	0	

Table 9.
Pearson Chi-Square test for the relation of age groups with anaesthesia types and dysuria.

Anesthesia type	Age group	Dysuria		Pearson Chi-Square
		No	Yes	
Spinal anesthesia	< 30 years	2	0	0.113
	31-45 years	2	1	
	46-60 years	6	0	
	61-75 years	9	0	
Local anesthesia	< 30 years	4	0	
	31-45 years	3	0	
	46-60 years	7	0	
	61-75 years	6	0	

The results of age group comparison for burning at voiding in patients given spinal anaesthesia showed that there was only one patient in age group 46-60 years who showed symptoms of burning. None of the patients in the local anaesthesia group had burning at voiding. There was non-significant ($p = 0.438$) difference of burning at voiding by type of anaesthesia and age (Table 8).

The results of age group comparison for the dysuria in patients given spinal anaesthesia showed that there was only one patient in age group 31-45 years who showed symptoms of dysuria. None of the patients in the local anaesthesia group had dysuria. There was non-significant ($p = 0.113$) difference for dysuria by type of anaesthesia and age (Table 9).

DISCUSSION

Altieri modified Nesbit corporoplasty for the treatment of penile curvature utilizes surgical approaches in patients with CPC or PD that are naïve to treatment or have previously used locally or systemic and drugs.

The choice of anesthetic technique to perform Altieri modified Nesbit corporoplasty has a major impact on how the patient responds during the postoperative period (22). In the present study, we compared the safety profile and the outcomes of local anesthesia vs loco-regional anesthesia for surgical treatment of penile curvature. The distribution of patients by age groups in the present study showed that most of the patients were in the elderly age group (61-75 years) which might be due to the reason that elderly population is at a high risk of diseases (23).

Additionally, our results also showed that more patients showed only mild pain in the spinal anesthesia group compared to the local anesthesia group which should be due to the section in the ligaments, fascia, or bone with localized bleeding (24). In the present study, the comparison of spinal and local anesthesia in the context of post-operative outcomes reveals that local anesthesia appears to be associated with a shorter hospital stay, potentially making it a more favorable choice for this particular procedure. There was a non-significant difference in penile shortening when it was compared in spinal and local anesthesia groups. These findings are consistent with the study conducted by *Ana et al.* who reported that surgical treatment of penile curvature under local anesthesia improves the cost-effectiveness ratio with the same quality of care, degree of satisfaction and postoperative functional results, maintaining a similar rate of intra/post-operative complications (25). Similarly, the results showed that 10% of patients in the spinal anesthesia group showed post-operative intestinal disorders and post-operative constipation compared to the local anesthesia group which might be due to the shorter time needed to return of bowel function (26). These results are in-line with the previous studies reporting post-operative constipation (27-28). Our results also showed a significant difference in post-operative bladder catheterization time when comparing spinal and local anesthesia groups as 100% of the patients had post-operative bladder catheterization in the spinal anesthesia group while none of the patients had post-operative bladder catheterization in local anesthesia group. Need of post-operative bladder catheterization after spinal anesthesia was due to the urinary retention (29). In the present study, due to the urinary retention, patients who had spinal anesthesia also showed signs of post-operative lower urinary tract symptoms. These findings are consistent with the previously reported studies (30, 31). Similarly, patients after surgery conducted by using spinal anesthesia also showed signs of voiding burning and dysuria. It has been reported that spinal anesthesia commonly leads to urinary retention because the patient is unable to feel the bladder sensation and to initiate voiding after the surgery. Bladder and sphincter muscles are unable to respond for voiding reflex (32, 33).

Altieri-modified Nesbit corporoplasty and minimally invasive techniques can offer effective solutions for penile curvature with high patient satisfaction rates and minimal complications (34). However, it has to be considered the specific patient population, the severity of the curvature, and the desired outcomes when choosing the most appropriate surgical technique and anesthesia type. The choice of anesthesia, whether spinal or local, should also consider the potential post-operative complications and the patient's overall health status. Further, the results of present study also showed that most patients in age group 61-75 years who were given spinal anaesthesia had hospital stay due to the deep sedation during spinal anaesthesia in older age group (35, 36). Furthermore, noticeable and distracting post-operative pain was observed among higher age group patients who were given spinal anesthesia that might be due to numbness, and motor weakness among older patients (37). Similarly, age group

comparison for the post-operative intestinal disorders showed more intestinal disorders among 61-75 years age group patients who were given spinal anaesthesia which could be due to increased colonic transit time among older patients (38). Our results also showed that patients in age group 61-75 years had post-operative constipation with spinal anaesthesia. These findings are consistent with previously reported studies (39).

Our findings showed that post-operative lower urinary tract symptoms were observed in patients with age groups 31-45 years and 46-60 years given spinal anaesthesia. Symptoms of voiding burning were observed in patients with age group 46-60 years whereas dysuria was observed in patients with age group 31-45 years. These findings are comparable to the previously reported studies (41, 42).

In conclusion, the choice of anesthesia technique for surgical treatment of penile curvature, particularly utilizing the Altieri modified Nesbit corporoplasty method, plays a pivotal role in determining postoperative outcomes. Our findings also support the preference for local anesthesia in terms of shorter hospital stays and less post-operative complications. Particularly, spinal anesthesia was associated with a higher risk of post-operative complications such as urinary retention and constipation. In summary, the choice of anesthesia method should be a well-considered decision that considers the individual patient's characteristics, the surgical technique to be employed, and the potential implications for postoperative outcomes, making it essential for healthcare professionals to make informed choices in the best interest of their patients. Moreover, long-term follow-up studies are required for making informed decisions about the choice of anesthesia. Future research should focus on collecting patient-reported outcomes to assess quality of life, psychological well-being, and sexual function after surgery.

Additionally, as surgical techniques and technology advance, the potential for minimally invasive procedures and innovations in anesthesia protocols may provide safer and more efficient options for patients. Collaboration through multi-center studies and international comparisons will help identify best practices and regional variations, ultimately leading to more personalized, effective, and globally accessible care for individuals seeking treatment for penile curvature.

CONCLUSIONS

This study comparing Altieri-modified Nesbit corporoplasty outcomes with spinal anesthesia and local anesthesia for congenital penile curvature and Peyronie's disease with spinal anesthesia and local anesthesia confirms the effectiveness of the surgical procedure and demonstrates that both approaches yield high patient satisfaction and minimal post-operative pain. However, spinal anesthesia was associated with a slightly higher rate of post-operative complications and significantly longer hospital stays compared to local anesthesia. Importantly, age did not significantly influence most clinical outcomes, except for post-operative pain, where older patients in the local anesthesia group reported slightly more discomfort. These findings provide valuable insights for clinicians,

aiding in the selection of anesthesia methods to optimize patient outcomes and enhance their overall surgical experience.

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