

Laparoscopic Uterosacral Nerve Ablation and Chronic Pelvic Pain

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Introduction

Chronic pelvic pain is often defined as constant or intermittent cyclic or acyclic pelvic pain that persists for 6 months or more,¹ while dysmenorrhea, deep dyspareunia, and intermenstrual pain constitute its main symptom complex, which is frequently investigated by laparoscopy. Chronic pelvic pain has high prevalence rates between 14% and 24%.² Due to its often bothersome effect, it can have a profound impact on a woman's personal health and quality of life, including an economic impact through loss of working hours. Treatment of chronic pelvic pain is sometimes unsuccessful, and hysterectomy often becomes the final resort.³ Therefore, a conservative surgery, if shown to be effective, would represent a major improvement in its management.

The presence of nerve plexuses and ganglia in the uterosacral ligaments has been known for over a century,⁴ and ablation of nerve plexuses and ganglions from the uterus has been performed for many years through abdominal or vaginal routes, and the nearest laparoscopic route, so-called laparoscopic uterosacral nerve ablation (LUNA). There are widespread variations in the LUNA technique without reliable evidence of effectiveness.⁵ Fortunately, some recent reports of randomized controlled studies have clarified some roles of LUNA in the control of pelvic pain.^{6,7}

Variations in LUNA Methods

LUNA originally involves the transection of the uterosacral ligaments as close to their insertion into

the cervix as possible. The procedure interrupts pelvic afferent sensory nerve fibers of the Lee-Frankenkauer nerve plexus. In a 1955 study of Doyle et al, vaginal transection of the nerves was effective for dysmenorrhea; however, recent anatomical studies by Fujii et al⁹ showed that the majority of uterosacral nerve fiber bundles were found at a distance of 6.5–33 mm and at a depth of 3–5 mm distal to the site of attachment of the uterosacral ligaments to the cervix. Wide variations in the practice of LUNA have been shown by comparing the UK group with the rest of Europe. The latter were more likely to completely transect the uterosacral ligaments (56% vs 36%) at a distance 2 cm or more from its cervical insertion (50% vs 21%) than the UK group. Even the tools for ablation varied between these 2 groups, i.e. laser cutting (3% vs 32%), electrodiathermy (78% vs 75%), scissors cutting (22% vs 15%), and harmonic scalpel for cutting (8% vs 11%).⁹ There is widespread clinical uncertainty in the techniques, with insufficient evidence of effectiveness, thereby making it both harder to determine the optimal time, depth, and site of LUNA procedures, and the opinions regarding its use uncertain and variable.

Effectiveness of LUNA

A structured survey was used to analyze gynecologists' prior beliefs on the effectiveness for LUNA on pelvic pain by both numeric response (on a 10-point visual analog scale [VAS]) and by responses to a questionnaire. The most widely held "prior belief" was that LUNA would have small beneficial effect on pain.¹¹

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LUNA for cyclic and noncyclic pelvic pain without endometriosis

Both uncontrolled and randomized double-blind studies had claimed support for LUNA with either complete relief or substantial reduction in menstrual pain in the majority of patients.⁶ Our preliminary randomized study using LUNA as an adjuvant therapy for treating patients with secondary dysmenorrhea caused by uterine myoma also showed the effect of LUNA in alleviating pain.¹² Another randomized study by Johnson et al⁶ included 123 patients with chronic pelvic pain. In 56 patients with no laparoscopic evidence of endometriosis, there was significant reduction of dysmenorrhea, with a median change in VAS from baseline -4.8 versus -0.8 ($p = 0.039$), or 42.1% versus 14.3% experiencing successful treatment ($p = 0.045$). However, there is no evidence that LUNA is beneficial for non-menstrual pelvic pain. In a recent meta-analysis of 5 randomized trials, the authors have approached a consensus on the effectiveness of LUNA for menstrual pain. Similar findings were reported by 4 other randomized trials.^{13,14}

LUNA for secondary dysmenorrhea with endometriosis

In a randomized trial of 180 patients with symptomatic endometriosis, the addition of LUNA to conservative laparoscopic surgery for endometriosis did not reduce the medium- or long-term frequency and severity of recurrent dysmenorrhea.⁷ Another randomized study of 67 patients with chronic pelvic pain and laparoscopic evidence of endometriosis found no significant difference in pain outcome.⁶

LUNA for other reasons

Vercellini et al's⁷ randomized study showed that LUNA had no additional effect for improvements in health-related quality of life, psychiatric profile, and sexual satisfaction. Also, another double-blind randomized study of LUNA by Johnson et al⁶ revealed no beneficial effect for dyspareunia and dyschezia.

Comparisons between LUNA and presacral neurectomy (PSN) or laparoscopic PSN (LPSN)

In a randomized study, the comparison between laparoscopic presacral neurectomy (LPSN) and LUNA for control of primary dysmenorrhea showed effectiveness of 87.9% and 82.9%, respectively, at the 3-month postoperative follow-up, whereas, long-term LPSN was shown to be more effective than LUNA (81.8% vs 51.4% at the 12-month visit).¹⁴

Another study showed that the efficacy of LUNA declined from 72% in the first year to 39% in the fourth year.¹³ However, only PSN but not LUNA was beneficial for alleviating secondary dysmenorrhea associated with endometriosis in some randomized studies.⁶

Adverse Events

The adverse events of PSN were significantly more common than those of LUNA. In general, LUNA is extremely safe except for a few complications reported in the literature, which might not be specifically associated with LUNA.⁵

Juang et al Study

We read with great interest the article by Juang et al.¹⁵ On the results of this 12-month follow-up study of LUNA for treating primary deep dyspareunia, the satisfactory rates at 3 and 12 months were 66.7% and 50%, respectively. To my knowledge, there has been no similar report specifically on the treatment of primary deep dyspareunia by the LUNA procedure. This procedure was originally designed for treatment of dysmenorrhea associated with endometriosis.⁶ Nevertheless, Vercellini et al⁷ found no significant advantage on sexual satisfaction by the LUNA procedure.

Deep dyspareunia is very complicated in its pathogenesis, which includes both physical and psychiatric/psychologic aspects; hence a verified system comprising clarified definitions and criteria in the assessment of satisfaction or improvement is mandatory, referring to, e.g. the suitability and rationale of using the Hospital Anxiety and Depression Scale (HADS) and the "revised" scale of the Sabbatsberg Sexual Rating Scale (rSSRS) for evaluating dyspareunia. Another comment on Juang et al's report is the lack of group evaluators, including personnel who are qualified for appraising a sexologic and psychiatric/psychologic questionnaire to give more informed insight. There is a need for elementary descriptions in this article of the operative depth, width, and distance to the cervical insertion of the uterosacral ligaments; as well as the preoperative and postoperative pain status, such as the presence of menstrual or non-menstrual pain. Finally, the rationale of LUNA procedures in treating primary deep dyspareunia requires explanation in Juang et al's article.

Summary

Chronic pelvic pain is a complicated syndrome comprised of different types of pain, including dysmenorrhea, deep dyspareunia, and intermenstrual pain, which can make interpretation difficult. Therefore, investigation of this complex syndrome requires very careful consideration.

Accumulating data from several randomized studies, we have now come to realize that LUNA can be an option in a few circumstances, especially for control of menstrual pain without endometriosis; however, its effectiveness may not extend to other indications, such as alleviating secondary dysmenorrhea associated with endometriosis (although it could, however, be reached by presacral neurectomy). Juang et al's article reports a very preliminary experience in the treatment of primary deep dyspareunia, presenting a promising perspective yet without sufficient evidence on the management of deep dyspareunia. A randomized controlled study with an adequate number of patients is warranted.

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