REVIEW

Laparoscopic uterosacral nerve ablation in chronic pelvic pain: an overview

Khalid S. Khan,1 Sabina F. Khan,2 Chika R. Nwosu,2 Linga S. Dwarakanath1 and Patrick F. W. Chien2

1 Birmingham Minimal Access and Surgical Training (MAST) Centre, Academic Department of Obstetrics and Gynaecology, University of Birmingham, UK
2 Department of Obstetrics and Gynaecology, Ninewells Hospital and Medical School, Dundee, UK

ABSTRACT

Objective To assess the efficacy of laparoscopic uterine nerve ablation (LUNA) in the treatment of chronic pelvic pain, by means of a systematic overview of the published literature.

Design Relevant papers were identified through electronic scanning of MEDLINE (1966–1997), EMBASE (1980m–1997), the Science Citation Index and the Cochrane Library, and manual searching of the bibliography of known primary and review articles. Study selection, study quality assessment and data abstraction were performed independently in duplicate. For controlled studies data were used to generate odds ratios (OR) and their confidence intervals (CI).

Subjects These were 555 women included in 11 case series and 250 women included in two controlled observational studies and three randomized trials.

Main outcome measure Pain relief, measured in general terms or assessed using visual analogue or numeric pain scales.

Results In the case of pelvic pain with no visible pathological findings at laparoscopy, randomized studies showed that LUNA had a trend towards better pain relief compared with no surgical intervention (OR 9.4, 95% CI 0.7 to 472; \(P=0.9\)) but its effect was inferior to presacral neurectomy (OR 0.24, 95% CI 0.07 to 0.8; \(P=0.01\)). Where there was endometriosis, controlled non-randomized studies showed that with ablative treatment of endometriosis, the outcomes were better with than without LUNA (OR 36.7, 95% CI 3.9 to 1625; \(P=0.001\)); however, presacral neurectomy did not show better results than LUNA (OR 0.30, 95% CI 0.03 to 1.76; \(P=0.1\)). One randomized controlled study in patients with endometriosis showed that LUNA plus ablative treatment was better than no intervention (OR 5.7, 95% CI 1.6 to 20.3; \(P=0.003\)), an effect that was not apparent in the subgroup with minimal endometriosis (\(P=0.24\)).

Conclusion On theoretical grounds, LUNA has the promise of an efficacious intervention in alleviating pelvic pain. However, the pitfalls in the published research that we have identified and evaluated make it impossible for us to conclude that this intervention is universally effective. At best there is a trend indicating effectiveness in relieving primary dysmenorrhoea and mild to moderate endometriosis. For the majority of women with chronic pelvic pain, there is not sufficient evidence to guide therapeutic decision making with regard to laparoscopic uterine nerve ablation.

Keywords chronic pelvic pain, pelvic denervation, systematic review.
INTRODUCTION

Chronic pelvic pain is a common cause of morbidity, crippling many women.\textsuperscript{1,2} It is a frequent reason for referral to the gynaecology service with an estimated cost to the UK National Health Service of 158 million pounds each year.\textsuperscript{3} The cause of the pain is often not obvious at diagnostic laparoscopy, and in the absence of pathological findings, treatment is usually pragmatic without concrete indications. The surgical approach to the management of this problem is based on the interruption of pain pathways. The existence of nerve plexuses and ganglia in the uterosacral ligaments is described in the literature.\textsuperscript{4,5} On theoretical grounds, division of these nerves should alleviate central pelvic pain. In his original work, Doyle\textsuperscript{6,7} reported pain relief in 69/73 (95\%) of women with primary dysmenorrhoea by means of transection of the uterosacral ligaments. Using the vaginal or abdominal approach, the attachments of these ligaments to the cervix were divided, which transected the uterine nerve trunks. The same tissue effect can be obtained laparoscopically by ablation of the uterosacral ligaments using laser or diathermy.

The ability to perform this procedure with minimal access surgery has revived uterine nerve ablation as a possible treatment option for women with chronic pelvic pain. In the face of enthusiasm for laparoscopic uterine nerve ablation (LUNA), we were concerned that its clinical efficacy may not have been assessed by methodologically sound research. Similar concern has been expressed by other authors,\textsuperscript{1,2,8} but a comprehensive overview of the literature has not been reported so far. The current Cochrane Library review focuses only on primary dysmenorrhoea and it excludes non-randomized studies.\textsuperscript{9} Therefore, we decided to conduct a systematic review of all published articles on this intervention.

METHODS

Identification of the literature

We conducted a comprehensive literature search to identify all the published observational and randomized studies evaluating the efficacy of laparoscopic uterine nerve ablation. The databases searched included MEDLINE, EMBASE, the Science Citation Index and the Cochrane Library. A combination of key words ‘uterine nerve ablation’ and ‘uterosacral nerve ablation’ was used to identify the maximum number of relevant citations in MEDLINE (1966–1997) and EMBASE (1980–1997). The Science Citation Index was searched prospectively to identify all the articles which cited Doyle’s original work\textsuperscript{6} on transection of the uterosacral ligaments. The Cochrane Controlled Trial Register was searched, and local experts on the laparoscopic treatment of chronic pelvic pain were contacted to identify any articles that might have been missed by our search strategy. Finally, the reference lists of all known primary and review articles were examined for additional relevant citations.

After completing the electronic literature search, the citation lists (titles, medical subject headings and abstracts where available), were independently reviewed by two of the authors (S.F.K. and C.R.N.). The citations were categorized as relevant or not relevant, on the basis of whether or not the study evaluated laparoscopic uterine nerve ablation in women with pelvic pain. The complete manuscripts of the citations considered relevant by any of the observers were then reviewed in full. Any article fulfilling the criteria listed below was considered eligible for inclusion in our overview. Study eligibility was independently assessed by two authors (K.S.K. and S.F.K.). Any disagreements regarding eligibility were resolved by consensus or arbitration by a third reviewer (L.S.D.).

Selection criteria

The following criteria were used to determine which studies were included in the overview.

Population. This should consist of women undergoing laparoscopy for constant or intermittent, cyclic or acyclic pelvic pain, that had persisted for months and included dysmenorrhoea, deep dyspareunia or intermenstrual pain.\textsuperscript{10}

Intervention. This was laparoscopic uterine nerve ablation compared with either expectant management or with another intervention.

Outcome. This was pain relief measured in general terms or assessed using visual analogue or numeric pain scales.

Data extraction and assessment of study quality

We extracted information from each article on the features of the study design, the characteristics of the population, the methods of carrying out the intervention and the assessment of outcomes. Data were extracted in duplicate (K.S.K. and S.F.K.) and abstracted data were examined independently by a
third author (L.S.D.) to minimize errors. Any disagreements were resolved by consensus.

We defined methodological quality as an assessment of the extent to which the rigour of the study design and conduct avoided biases in the estimate of therapeutic efficacy, thereby focusing on the internal validity of the study. The lowest quality evidence was provided by observational studies consisting of case series and case reports. Controlled observational studies formed a higher level of evidence. Those with a retrospective design and historical controls were considered weaker than prospective studies with concurrent enrollment of controls and cases. Randomized trials provided the highest level of evidence as they were least subject to bias. Randomized trials were subjected to further scrutiny of their quality, according to features of randomization, blinding and follow up. Trials having inadequacies in these aspects of study design provide an exaggerated estimate of treatment effect compared with those which do not. Features of population and outcome also have an impact on the validity of observational studies. We therefore evaluated each study for these items. In observational studies, population enrollment was considered adequate if women in the series were consecutive patients. In randomized trials enrollment was considered adequate if the randomization sequence was generated properly and was concealed until the time of the intervention. Outcome assessment was considered adequate if the women were kept blind to their group allocation, objective measures of pain were used, the duration of follow up was longer than 3 months, and the follow-up was >95% complete.

**Analysis**

Percentage agreement and the weighted kappa statistic were used for the analysis of agreement between the reviewers. Minimally acceptable agreement was set at a kappa level of 0.6. Analysis of the literature included in the overview was performed separately for chronic pelvic pain with and without positive pathological findings.

For case series the percentage of patients with pain relief was calculated.

For controlled studies data were used to construct 2x2 tables from which odds ratios (OR) and their confidence intervals (CI) were calculated using the Epi Info software. The OR represented the ratio of the odds of symptom relief in women with LUNA to the odds of symptom relief in the comparative group, i.e. OR > 1 indicated that LUNA provided better pain relief than the comparative intervention while OR < 1 indicated that women with LUNA were worse. In 2x2 tables with empty cells, one was added to all the cells for the calculation of the ORs and exact CIs. In this circumstance, the 95% CIs are usually imprecise. We originally planned to combine studies to produce a pooled estimate of effect. However, the studies were so heterogeneous that it did not make methodological sense to combine them statistically.

**RESULTS**

**Literature search**

The total number of citations identified initially was 88 (MEDLINE 34, EMBASE 22, Science Citation Index 27, Cochrane Library 5). Of these, 45 citations were considered relevant (MEDLINE 19, EMBASE 15, Science Citation Index 6, Cochrane database 5). There was reviewer agreement over relevance or irrelevance on 80/88 citations (91% agreement, kappa 0.81). The 45 citations considered relevant actually represented only 19 articles because many of the citations were repeated in the various databases that were searched. The full manuscripts of these articles were evaluated and nine studies were finally included in the overview. Reviewer agreement regarding inclusion or exclusion of these studies was 100% (kappa 1.0).

An additional seven studies were identified through review of the bibliographies of known primary and review articles or through contact with experts. The main reason for exclusion was that laparoscopic uterine nerve ablation was not the intervention studied, or that the description of the intervention was unclear, especially in studies where laser laparoscopy was used for endometriosis.

**Methodological quality assessment**

The overview was therefore based on the 16 studies shown in the appendix and in Tables 1 and 2. Of these, 11 were case series, two were controlled observational studies (one retrospective and one prospective) and three were randomized trials. Three of the case series (A4, A7, A14) provided analyses of subgroups with and without visible disease. Generally, the case series (A1, A3–A9, A12, A14, A15) gave poor descriptions of the characteristics of their study design. Where reported, the enrollment of the women was not always consecutive, assessments of outcome were based on subjective
Laparoscopic uterine nerve ablation in pelvic pain without visible pathological appearances

Our search identified four observational case series and two randomized trials in women with menstrual pain and no visible disease at diagnostic laparoscopy. The four case series provided evidence of symptom relief in 36–91% patients at 6–12 months follow up (Table 1).

In the quasi-randomized trial (A10) 5/11 (45%) of the women reported significant relief from menstrual pain 12 months after laparoscopic uterine nerve ablation compared with 0/10 in the control group (OR 9.4, 95% CI 0.7 to 472, \( P = 0.09 \)). In another randomized trial (A2) laparoscopic uterine nerve ablation was compared with presacral neurectomy. At 12 months 27/33 (82%) of women undergoing presacral neurectomy showed more than 50% pain relief compared with 18/35 (51%) of women treated by uterine ablation (OR 0.24, 95% CI 0.07 to 0.08; \( P = 0.01 \)). Although presacral neurectomy seems to be better than laparoscopic uterine nerve ablation, it was associated with constipation in 94% of the women in this trial.

Laparoscopic uterine nerve ablation in pelvic pain associated with endometriosis

Our search identified seven case series, two observational comparative studies and one randomized trial in women with endometriosis, where the symptoms included dysmenorrhoea, pelvic pain not related to menstruation and dyspareunia. Some of the case series also included women without any disease. Laparoscopic uterine nerve ablation was beneficial in 72–93% of the women when assessed 12–18 months after their operation (Table 2).

The controlled observational studies included one study (A11) comparing laparoscopic uterine nerve ablation plus ablation of the endometriosis with ablation of the endometriosis alone. Laparoscopic ablation of uterine nerve and endometriosis gave better results than ablation of endometriosis alone (relief of non-menstrual pain at 18 months follow up: OR 36.7, 95% CI 3.9 to 1625; \( P = 0.001 \)) (Table 2). The other controlled study (A16) was retrospective in design, and it compared laparoscopic uterine nerve ablation with laparoscopic presacral neurectomy in women having laparoscopic treatment for endometriosis; there was no difference between the two methods of pelvic denervation (OR for relief of menstrual pain at 6 months after treatment 0.30, 95% CI 0.04 to 1.76; \( P = 0.1 \)).

The randomized trial in women with endometriosis (A13) showed resolution or improvement of symptoms in 20/32 (62%) women at 6 months after laparoscopic ablation of endometriosis plus uterine nerve ablation; in the control group only 7/31 (23%) showed improvement (OR 5.7, 95% CI 1.5 to 343; \( P = 0.003 \)). Although the overall differences in the two groups were statistically significant, the subgroup of women with minimal endometriosis did not show any benefit with treatment (6/13 vs. 4/16, \( P = 0.24 \)).

DISCUSSION

In this overview of the role of laparoscopic uterine nerve ablation in the management of chronic pelvic pain, an attempt was made to fulfil the criteria for a rigorous systematic review.16 A clear research question was posed; the literature search, data abstraction and quality assessments were performed in duplicate, and quantitative summary of the evidence was produced where possible. Hence, the inferences are likely to be more valid than those of traditional and qualitative reviews which are notorious for combining opinion with evidence. From this overview, laparoscopic uterine nerve ablation seems to be an efficacious intervention in dysmenorrhoea without pelvic disease, and in endometriosis when it is used along with ablation of mild to moderate endometriosis.

The quality of the literature on which our inferences were based was relatively poor. In particular, there was a lack of high quality randomized evidence. There was no lack of observational case series, and we have summarized all such reports that we identified from our search. However, observational studies without control arms
provide the lowest level of evidence, as we highlighted in the description of quality assessment. One might then question our wisdom in including this literature in our overview. We reviewed identified case series because in health technology assessment of minimal access surgery there has to be an initial evaluation of the safety and stability of new interventions. One view is that randomized trials should not be entertained until the evaluative phase has been completed. The case series, in our view, provide this evaluative evidence for laparoscopic performance of uterine nerve ablation with laser or diathermy. However, this evidence alone is not sufficient to assess the clinical effectiveness of uterine nerve ablation for which randomized trials remain the gold standard.

We considered the evaluation of outcomes to be an important factor in avoiding biases in the assessment of therapeutic efficacy. Ideally, there should be double-blinding but this is not possible in studies of surgical interventions such as laparoscopic uterine nerve ablation. However, maintenance of single-blinding is essential because patients’ awareness of their group allocation can modify their responses. In the measurement of pain we regarded objective measures as better than subjective assessments. In scaled measures of pain, patients find it difficult to choose between two adjacent categories of pain as interpretation of differences between categories is unclear. Because of this problem, visual analogue scales for measurement of pain were considered superior to other methods of evaluation of pain. The duration of follow up was considered adequate by us only if assessments were made after 3 months or more. This is because the placebo effect can be expected to last for up to 3 months in patients with pelvic pain. The lack of these features in many of the studies has an impact on the strength of our conclusions.

Our inferences regarding the clinical effectiveness of uterine nerve ablation in dysmenorrhea without visible pathological appearances were based mainly on two randomized trials (Table 1, Fig. 1). This evidence showed that uterine nerve ablation provided better pain relief compared with no surgical intervention, but this result was not statistically significant. Conversely, uterine nerve ablation was inferior when compared to presacral neurectomy. However, presacral neurectomy was associated with a significant adverse effect on bowel function, resulting in constipation. In addition, presacral neurectomy is a more extensive surgical intervention, and the Royal College of Obstetricians and Gynaecologists classifies it as a level 4 procedure requiring advanced skills. Hence, presacral neurectomy cannot be recommend for widespread use. Laparoscopic uterine nerve ablation, on the other hand, is a simple procedure and does not require a subspecialist. If it is shown to be effective in future research, its wider application in the management of women with pelvic pain would be practicable.
### Table 1  Laparoscopic uterine nerve ablation in chronic pelvic pain without visible pathology

<table>
<thead>
<tr>
<th>Published study</th>
<th>Enrolment</th>
<th>Study design</th>
<th>Nerve ablation modality</th>
<th>Method of pain measurement</th>
<th>Follow up</th>
<th>Duration, completeness</th>
<th>Symptom relief (%)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Observational studies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feste et al. 1985 [A5]</td>
<td>Consecutive 10</td>
<td>Case series</td>
<td>CO2 laser</td>
<td>Not described</td>
<td>12</td>
<td>&gt;95</td>
<td>7/10 (70)</td>
<td>c</td>
</tr>
<tr>
<td>Danieli 1989 [A4]</td>
<td>Not described 20</td>
<td>Case series</td>
<td>KTP laser</td>
<td>Not described</td>
<td>6</td>
<td>&gt;95</td>
<td>12/20 (60)</td>
<td></td>
</tr>
<tr>
<td>Donmez et al. 1989 [A5]</td>
<td>Not described 100'</td>
<td>Case series</td>
<td>CO2 laser</td>
<td>Not described</td>
<td>&gt;12</td>
<td>&gt;95</td>
<td>91/100 (91)</td>
<td></td>
</tr>
<tr>
<td>Gurgan et al. 1992 [A8]</td>
<td>Not described 25</td>
<td>Case series</td>
<td>CO2 laser</td>
<td>Verbal multidimensional score</td>
<td>5</td>
<td>86</td>
<td>14/20 (70)</td>
<td></td>
</tr>
<tr>
<td>Wiborny et al. 1998 [A15]</td>
<td>Not described 16</td>
<td>Case series</td>
<td>Diathermy + scissors</td>
<td>Not described</td>
<td>12</td>
<td>61</td>
<td>5/14 (36)</td>
<td></td>
</tr>
<tr>
<td><strong>Experimental studies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lichten et al. 1987 [A10]</td>
<td>Odd/even 21</td>
<td>11 allocated to LUNA</td>
<td>Diathermy + scissors</td>
<td>5-point rating system</td>
<td>3</td>
<td>&gt;95</td>
<td>9/11 (82)</td>
<td>vs. 0/10 (0)</td>
</tr>
<tr>
<td>Chen et al. 1996 [A2]</td>
<td>Randomization, 68</td>
<td>55 allocated to LUNA</td>
<td>Diathermy</td>
<td>5-point rating system</td>
<td>12</td>
<td>&gt;95</td>
<td>5/11 (45)</td>
<td>vs. 0/10 (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LUNA, laparoscopic uterine nerve ablation; LPSN, laparoscopic presacral neurectomy.  
* Patients with dysmenorrhoea were enrolled in all the studies.  
* In the absence of original figures, outcome data computed from percentages reported in the original papers.  
* Comparisons shown as LUNA vs. other group.  
* Criteria for symptom relief not described.  
* Unclear whether only patients without pathology were included.  
* Symptom relief defined as pain relief of 50–100%.  

### Table 2  Laparoscopic uterine nerve ablation in chronic pelvic pain associated with endometriosis

<table>
<thead>
<tr>
<th>Published study</th>
<th>Enrolment</th>
<th>Study design</th>
<th>Nerve ablation modality</th>
<th>Method of pain measurement</th>
<th>Follow up</th>
<th>Duration, completeness</th>
<th>Symptom relief (%)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Observational studies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter et. al. 1985 [A1]</td>
<td>Consecutive 56</td>
<td>Case series of laparoscopic treatment including LUNA</td>
<td>Nd:YAG laser</td>
<td>1–10 pain scale</td>
<td>Outcome data not reported separately for LUNA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sutton, 1989 [A14]</td>
<td>Not described 100</td>
<td>Case series</td>
<td>CO2 laser</td>
<td>Visual analogue scale</td>
<td>–</td>
<td>94</td>
<td>81/94 (86)</td>
<td></td>
</tr>
<tr>
<td>Danieli 1989 [A4]</td>
<td>Not described 80</td>
<td>Case series of LUNA</td>
<td>KTP laser</td>
<td>Not described</td>
<td>6</td>
<td>&gt;95</td>
<td>60/80 (75)</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Patients</td>
<td>Procedures</td>
<td>Laser Type</td>
<td>Scale</td>
<td>Criteria</td>
<td>Outcome</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>----------</td>
<td>------------</td>
<td>------------</td>
<td>-------</td>
<td>----------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>Papasakelatou, 1995 [A12]</td>
<td>Consecutive</td>
<td>52</td>
<td>Case series of LUNA</td>
<td>CO₂ laser</td>
<td>Pain relief scale 0–10</td>
<td>12</td>
<td>86</td>
<td>51/45 (72)</td>
</tr>
<tr>
<td>Ostrzenski et al. 1991 [A11]</td>
<td>Patients’ choice</td>
<td>40</td>
<td>20 allocated to LUNA</td>
<td>CO₂ laser</td>
<td>Not described</td>
<td>18</td>
<td>&gt;95</td>
<td>20/20 (100) vs. 7/20 (35)</td>
</tr>
<tr>
<td>Zullo et al. 1996 [A16]</td>
<td>Retrospective</td>
<td>58</td>
<td>34 cases with LUNA</td>
<td>Bipolar diathermy</td>
<td>1–10 numeric linear pain scale</td>
<td>6</td>
<td>&gt;95</td>
<td>25/33 (76) vs. 21/23 (91)</td>
</tr>
<tr>
<td>Sutton et al. 1994 [A13]</td>
<td>Randomization</td>
<td>63</td>
<td>32 allocated to LUNA</td>
<td>CO₂/KTP laser</td>
<td>Visual analogue scale</td>
<td>3</td>
<td>85</td>
<td>18/32 (56) vs. 15/31 (48)</td>
</tr>
</tbody>
</table>

LUNA, laparoscopic uterine nerve ablation; LPSN, laparoscopic presacral neurectomy; KTP, Potassium-titanyl-phosphate; TCRE, transcervical resection of endometrium.

a Patient symptomatology included dysmenorrhoea, nonmenstrual pelvic pain and dyspareunia.

b In the absence of original figures outcome data computed from percentages reported in the original papers.

c Comparisons shown as LUNA vs. other group.

d Criteria for symptom relief not described.

e Symptom relief defined as pain cured or improved based on subjective assessment.

f Symptom relief defined as pain relief of 2 points or more.
In endometriosis, our conclusions on the clinical effectiveness of uterine nerve ablation were based on two controlled non-randomized studies and one randomized trial (Table 2, Fig. 1). The non-randomized studies showed that ablative or excisional treatment for endometriosis when accompanied by pelvic denervation showed improved outcomes, but presacral neurrectomy did not prove any more effective than uterine nerve ablation. The only randomized controlled study in endometriosis supported the role of uterine nerve ablation along with ablative or excisional treatment compared with no surgical intervention. Although this study was rigorous, it was not designed to address the following issues: in minimal endometriosis, it did not show a benefit (a result that may represent a type II error arising from small sample size), and in mild to moderate endometriosis, it could not distinguish whether the benefit arose from the transection of the uterosacral ligaments or from the ablation of the endometriotic lesions. A provisional report of a subsequent unpublished study to clarify the latter issue did not demonstrate any beneficial effect from the use of uterine nerve ablation.22

In summary, the promise of this simple procedure, based on division of nerves known to be anatomically located in the uterosacral ligaments, is not fulfilled by the evidence produced by its proponents so far. The pitfalls in the published research that we identified and evaluated make it impossible for us to conclude that this intervention is universally effective. At best there is a trend that it is effective in primary dysmenorrhoea and mild to moderate endometriosis. For the majority of women with chronic pelvic pain, there is not sufficient evidence to guide therapeutic decision making with regard to laparoscopic uterine nerve ablation. Therefore, there is a need for a rigorous randomized controlled trial to establish the efficacy of laparoscopic uterosacral nerve ablation in women with chronic pelvic pain. Such a trial has been designed to address the outcomes of this intervention with respect to pain, sexual function and quality of life. This multicentre study has commenced recruitment and is being coordinated from the Birmingham Clinical Trials Unit, UK.23 No doubt, in due course, we will report the results of the completed study.

REFERENCES


Birmingham Clinical Trials Unit. The Luna Trial. URL: http://www.cancer.bham.ac.uk

**APPENDIX: STUDIES INCLUDED IN THE OVERVIEW OF LAPAROSCOPIC UTERINE NERVE ABLATION IN CHRONIC PELVIC PAIN**


