

Peritonitis due to iatrogenic colpotomy after large loop excision of the transformation zone (LLETZ) in a patient with cervical intraepithelial neoplasia III: our experience of a rare case with review of the literature

M. Varras¹, C. Akrivis², A. Anastasiadis¹, G. Lekkas¹, G. Diakakis¹

¹Department of Obstetrics and Gynecology, "Elena Venizelou" General Maternity Hospital, Athens;

²Department of Obstetrics and Gynecology, "G. Chatzikosta" General State Hospital, Ioannina (Greece)

Summary

A case of peritonitis as an unusual complication of LLETZ (large loop excision of the transformation zone) for the treatment of CIN III associated with unrecognized iatrogenic posterior colpotomy is presented. After the procedure, the patient developed fever 38.3°C and diffused severe pelvic pain. The contributing factors, prevention and management of this complication are discussed. Also, the complications of cold knife cervical conization and LLETZ procedure are reviewed.

Key words: Cervical intraepithelial neoplasia; Treatment; Cervical cone biopsy; LLETZ; Complications; Peritonitis.

Introduction

Large loop excision of the transformation zone (LLETZ) is an effective method for the treatment of pre-malignant cervical disease. It has the advantage of being simultaneously diagnostic and therapeutic. It is often performed as an outpatient procedure and because there is only minimal tissue damage, is considered to provide an adequate sample for histological analysis [1, 2].

We present a case of peritonitis due to unrecognized iatrogenic posterior colpotomy, which occurred as a consequence of LLETZ. Our review of the literature yielded very few similar reports [3-5]. The purpose of this article is to point out the potential hazards of loop electro-surgical excision.

Case Report

A 23-year-old woman was found to have a cervical intraepithelial lesion (CIN) III diagnosed by colposcopy and guided cervical biopsies and was treated with large loop excision of the transformation zone (LLETZ) under general anesthesia in a private maternity hospital in Athens, Greece. The cervical tissue was removed in one piece measuring 2.5 x 3 cm in diameter. The next day, the patient was admitted to the Emergency Department of a State Hospital in Athens and hospitalized because of fever 38.3°C and diffused pelvic pain. Physical examination demonstrated mild tachypnea; the abdomen was distended, with guarding and rebound tenderness. Detailed inspection of the vagina and cervix was difficult because of the patient's discomfort but pus-like discharge was noted inside the vagina. Bimanual gynecological examination showed high tenderness cervical motion. Estimation of the uterus and the adnexa was difficult because of the resistance of her abdominal

wall. The patient was hemodynamically stable, with good bladder function. Peristaltic sounds were diminished. Hematocrit was 40.1%, hemoglobin 13.9 gr/dl and white blood count 11,000/mm³, with 91.8% polymorphonuclear leucocytes and platelets 140,000/μl. General urinalysis was negative. Renal and liver function tests were normal. A computed tomography (CT) scan of the upper and lower abdomen showed hydronic levels at the small and large bowel without a picture of complete obstruction, and identified the presence of gas within the uterine cavity (Figure 1).

An emergency laparotomy was performed. Diffused peritonitis with abdominal pus was found without great effects of adhesions and an opening of about 2 cm in the maximum diameter in the posterior vaginal wall was observed through the posterior space of Douglas (Figure 2). No bowel perforation was detected and the vermiform appendix macroscopically was normal. The abdomen and pelvis were washed with adequate amounts of fluid and the deficit in the posterior vaginal wall was easily repaired using interrupted absorbable sutures. Also, interposition of omentum was used to ensure the repair of the colpotomy (Figure 3). Cultures of the abdominal pus grew great colonies of *E. coli* and *enterococcus faecalis*. Postoperatively, intravenous broad-spectrum antimicrobial therapy was given: mitromidazole 500 mg/100ml three times daily and a combination of piperacillin sodium (4 g) with tazobactam sodium (0.5 g) four-times daily. In addition, heparin of low molecular weight was administered for all the postoperative days the patient remained in hospital. The patient's postoperative course was uneventful. The histopathological examination of the surgical cervical specimen confirmed the existence of CIN III; the surgical borders were free of disease.

Discussion

Cold knife conization of cervix is used as a diagnostic and therapeutic modality for cervical intraepithelial neoplasia [6]. However, the LLETZ procedure is the procedure of choice for such cases. It is performed with a large loop of thin wire, which forms a diathermy electrode and

Revised manuscript accepted for publication April 22, 2011

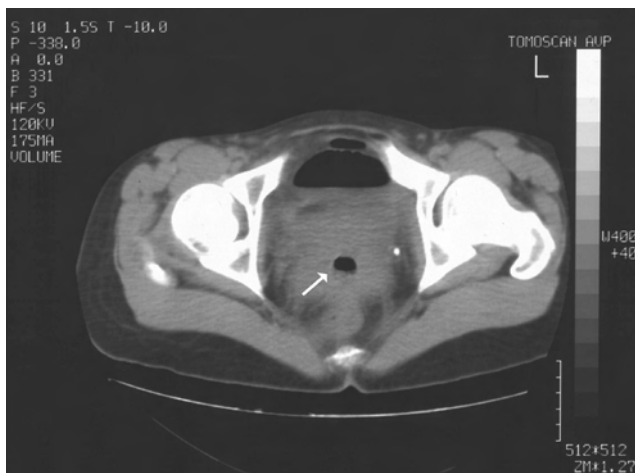


Fig. 1



Fig. 2



Fig. 3

Figure 1. — Computed tomography (CT) scan of the lower abdomen shows the presence of gas within the uterine cavity (arrow).

Figure 2. — Opening in the posterior vaginal wall through the posterior space of Douglas showing a rare complication of LLETZ.

Figure 3. — Interposition of omentum is used to ensure the repair of the iatrogenic posterior colpotomy.

allows a deep excision of the transformation zone with minimal tissue damage [1]. Most surgeons prefer to excise the tissue in one piece. Thus, the loop size is chosen according to the diameter of the transformation zone [1]. In 1984, Cartier first described LETZ (loop excision of transformation zone) as electrodiathermy loop excision using a small wire loop for accurate directed cervical biopsies [7]. Prendeville *et al.* in 1989, adapted this technique by designing larger fine wire loops and called it LLETZ (large LETZ). They reported a successful cure rate of 98% for CIN at a single treatment [8]. The equipment was cheap, simple and the technique was easy to learn [2]. The recurrence rates of LLETZ are 4%, similar to those of cold knife and laser conization [1, 9, 10].

Complications of cold knife conization are related with 12-20% morbidity [6]. Early complications are hemorrhage and infection, with bleeding occurring at a frequency of 4-21% of cases [6, 11]. Also, a retroperitoneal hematoma has been described, probably due to trauma to the vaginal artery caudal to its branching from the uterine artery [6]. Placement of hemostatic sutures at the conclusion of the conization procedure to ligate the descending cervical branch of the uterine artery has been recommended to decrease the frequency of postoperative bleeding [12-15]. Also, Monsel's solution and vaginal pack

without hemostatic sutures are effective in protecting cervical hemorrhage [16]. Cervical stenosis is a late complication of cold knife conization from damage to the cervical channel and causes dysmenorrhea, if partial stenosis occurs or hematometra if the stenosis is complete [6, 11]. The incidence of hematometra has been reported to be less than 1% [17]. In some of the reported cases the patients have resumed normal menstruation after surgery, but later developed constriction of the canal that resulted in amenorrhea. Group B streptococcal meningoen- cephalitis and retroperitoneal psoas abscess have also been reported [11, 18]. A possible pathogenetic mechanism for the development of retroperitoneal psoas abscess is an inadvertent opening of the retroperitoneal space during the cone biopsy causing direct spread of infection to this space [11]. Finally, bowel, bladder and ureteral injuries have been described [13-15]. In patients with cystocele or enterocele, a dissection of the anterior and posterior vaginal mucosa might improve the exposure of the cervical and paracervical tissue, decreasing therefore the risk of bowel, bladder and ureteral injury [15].

The significant advantages of LLETZ compared to laser or cold knife conization are shorter operative time, less handling of the tissue, reduced bleeding and reduced discomfort for most of the procedure. Moreover, there is

no hazard to the surgeon's eye-sight, and equipment breakdown occurs less often, leading to higher efficiency at a relative lower cost [1, 19-22]. The short-term complications of LLETZ include infection, vaginal discharge, and inadvertent injury to vaginal sidewalls [2]. The most common long-term complication is cervical stenosis [2]. To minimize the incidence of cervical stenosis, a loop depth of 8 mm, which is the maximum crypt depth, has been recommended. Patients with evidence of cervical canal involvement may require a separate pass of a smaller loop to excise the deeper aspect of the cervical canal effectively. The cone excision can thus be extended to various depths with some authors stating that this normally should not exceed more than 10-20 mm into the canal [23]. Rare complications of the LLETZ procedure are infections and infertility caused by cervical stenosis [1]. Also, cervical incompetence is included in the complications of the procedure [2]. Nannapaneni *et al.* [2] described an extremely rare complication of intraabdominal bleeding following LLETZ.

Peritonitis as a complication of cervical conization with cold knife or diathermy loop excision of the transformation zone for treatment of CIN has rarely been described [3-5] and the causes for this event are usually an incidental colpotomy due to anatomical particularity of the cervical outline, extensive cervical lesions or extensive cervical resection [5]. In addition, patient with a distorted cervix, previous cervical conization or pelvic irradiation are at increased risk [1]. In the patient described here an emergency laparotomy was performed based on her history of recent LLETZ and her clinical picture. We believe that contributory factors to the formation of colpotomy were the anatomical distinctiveness of the cervical outline and the extensive cervical lesion. The resection of a CIN lesion with a smaller size of loop or with the use of needle excision of the transformation zone (NETZ) should possibly have prevented this complication. Iatrogenic insertion of air, found in the CT scan, through the cervix within the endometrial cavity during the surgery the previous day is an option. Another possible option, but less common is the production of gas due to *E. Coli* (endometritis emphysematosa).

Conclusions

LLETZ is an excellent technique for the treatment of CIN. Complications are usually few and mild, mainly minor bleeding and discomfort. Our case serves as a reminder that the LLETZ procedure, although simple and easily performed can result in major complications. Extremely rare complications are peritonitis and bowel obstruction. Surgeons should be aware of these possibilities because immediate identification is crucial for prevention of further damage. It is suggested that in cases with anatomical particularity of the cervical outline or extensive cervical lesions one should use a smaller loop-wire or make a needle excision of the transformation zone (NETZ) for the treatment of CIN.

References

- [1] Krissi H., Ben-Rafael Z. Levavi H.: "Fistula formation after large loop excision of the transformation zone in patients with cervical intraepithelial neoplasia". *Acta Obstet. Gynecol. Scand.*, 2001, 80, 1137.
- [2] Nannapaneni P., Naik R., de Barros Lopes A., Monaghan J.M.: "Intra-abdominal bleed following LLETZ". *J. Obstet. Gynaecol.*, 2002, 22, 99.
- [3] Steinfeld H.J., Haddock J.B.: "Case report: peritonitis complicating cone biopsy of the cervix". *Md. Med. J.*, 1995, 44, 528.
- [4] Duggan B.D., Felix J.C., Mudderspach L.I. Gebhardt J.A., Groshen S., Morrow P., Roman L.D.: "Cold-knife conization versus conization by the loop electrosurgical excision procedure: a randomized, prospective study". *Am. J. Obstet. Gynecol.*, 1999, 180, 276.
- [5] Raynal P., Lucas J.: "Pelvipéritonite et occlusion intestinale: deux complications atypiques de la conisation au bistouri froid". *J. Gynéc. Obstét. Biol. Reprod.*, (Paris), 2003, 32, 43.
- [6] Brown C.F., Mashini I.S., Turner W.A., Gallup D.G.: "Retroperitoneal Hematoma: an unusual complication of cold knife conization of the cervix". *Obstet. Gynecol.*, 1986, 665, 68, 66S.
- [7] Cartier R.: "Practical colpotomy". *Paris Laboratoire Cartier*, 1984, 2, 139.
- [8] Prendeville W., Cullimore J., Norman S.: "Large loop excision of the transformation zone (LLETZ). A new method of management for women with cervical intraepithelial neoplasia". *Br. J. Obstet. Gynaecol.*, 1989, 96, 1054.
- [9] Zwabineli N.J., Davis J.A.: "Fistula injury to the bladder at repeated cone biopsy by laser". *Eur. J. Obstet. Gynaecol.*, 1992, 43, 245.
- [10] Flannelly G., Langhan H., Jandial L., Mana E., Campbell M., Kitchener H.: "A study of treatment failure following large loop excision of the transformation zone for the treatment of cervical intraepithelial neoplasia". *Br. J. Obstet. Gynaecol.*, 1997, 104, 718.
- [11] Ray S., Ferguson A.: "Retroperitoneal psoas abscess complicating cervical conization: a case report". *J. Obstet. Gynaecol.*, 2005, 25, 319.
- [12] Webb M.J. Mayo Clinic Manual of Pelvic Surgery, 2nd ed. Lippincott, Williams and Wilkins (ed), 2000, 74.
- [13] Gershenson D.M., DeCherney A.H., Curry S.L.: "Operative Gynecology". W.B. Saunders (ed.) 1993, 268.
- [14] Lee R.A.: "Atlas of Gynecologic Surgery". Philadelphia, W.B. Saunders (ed.), 1992, 101.
- [15] Contag S.A., Wilson T.O.: "Ureteral injury during cold-knife cervical conization - a case report". *J. Pelvic Med. Surg.*, 2004, 10, 81.
- [16] Gilbert L., Saunders N.J., Stringer R., Sharp F.: "Hemostasis and cold knife cone biopsy: a prospective randomized trial comparing a suture versus non-suture technique". *Obstet. Gynecol.*, 1989, 74, 640.
- [17] Hirai K., Kanaoka Y., Sumi T., Yasui T., Nakai Y., Nishio J. *et al.*: "Occlusion of the external cervical os after conization in a post-puerperal amenorrheic woman". *Arch. Gynecol. Obstet.*, 2004, 270, 64.
- [18] Robibaro B., Vorbach H., Weigel G., el Menyawi I, Djanvnmard M, Breyer S, Graninger W.: "Group B streptococcal meningoencephalitis after conization in a nonpregnant woman". *Clin. Infect Dis.*, 1998, 26, 1243.
- [19] Gunasekera P.C., Phipps J.J., Lewis B.V.: "Large loop excision of the transformation zone compared to carbon dioxide laser in the treatment of CIN: A superior mode of treatment". *Br. J. Obstet. Gynaecol.*, 1990, 97, 995.
- [20] Moor E.J., Fitzpatrick C.C., Coughlan B.M., McKenna P.H.: "Cone biopsy: a review of 112 cases". *Ir. Med. J.*, 1992, 85, 28.
- [21] Alvarez R.D., Helm V.W., Edwards R.P., Naumann R.W., Patridge E.E., Shingleton H.M. *et al.*: "Prospective randomized trial of LLETZ versus laser ablation in patients with cervical intraepithelial neoplasia". *Gynecol. Oncol.*, 1994, 52, 175.
- [22] Kainz C., Tempfer C., Sliutz G., Breitnecker G. Reinthaller A.: "Radiosurgery in the management of cervical intraepithelial neoplasia". *J. Reprod. Med.*, 1996, 41, 409.
- [23] NewKirk G.R.: "Office procedures. Electrosurgical loop excision of the cervix". *Primary Care*, 1997, 24, 281.

Address reprint requests to:
M. VARRAS, M.D.
Platonos 33, Politia (Kifisia)
14563 Athens (Greece)
e-mail: mnvarras@otenet.gr