

**ACCURACY OF ULTRASOUND SCAN IN PATIENTS UNDERGOING PELVIC EXENTERATION AND
LATERALLY EXTENDED PELVIC RESECTION (Pre-PEX study).**

Study protocol

Version 2.0, 29/05/2020



Principal investigator:

Prof. Antonia Testa

Policlinico Agostino Gemelli IRCCS

Dipartimento per la salute della Donna e del Bambino e della Salute Pubblica

UOC Ginecologia Oncologica

Largo Agostino Gemelli 8, 00168

Rome, ITALY

Signature:

Responsibles: Dr. Nicolò Bizzarri, Dr.ssa Francesca Moro, Dr. Giuseppe Vizzielli

Promoting Institution

Policlinico Agostino Gemelli IRCCS
Dipartimento per la salute della Donna e del Bambino e della Salute Pubblica
UOC Ginecologia Oncologica
Largo Agostino Gemelli 8, 00168
Rome, ITALY

Introduction

Growing evidence in literature is supporting the role of ultrasound scan (US) as accurate tool in diagnosis and staging of gynecologic cancers [1]. In particular, different studies demonstrated the accuracy of US in assessing endometrial [2], cervical [3], and ovarian cancer [4] in the primary setting. However, the number of studies investigating the role of US in the recurrent setting is limited [5-7]. Moreover, there is no evidence in literature exploring the role of US in laterally-extended pelvic recurrences from gynecologic cancer [8], where the Magnetic Resonance Imaging (MRI) scan is still considered the most accurate tool [9].

Objective of the study

The objective of the study is to assess the performance of US in patients undergoing pelvic exenteration and laterally extended pelvic resection.

The primary objective of the present study is to evaluate the accuracy of US in the assessment of pelvic structures involvement in recurrent/persistent gynecologic tumors with disease limited to the pelvis.

Secondary objective is to compare accuracy of US with the accuracy of MRI scan using histology as standard.

Type of study

Prospective, observational, cohort, single center

Inclusion criteria

All consecutive patients with histologically-proven recurrent or persistent gynecological cancer who are planned to undergo pelvic exenteration or laterally extended pelvic resection, both with curative and with palliative intent.

- Anterior/total pelvic exenteration
- Laterally extended endopelvic resection (LEER) [10]
- Laterally extended pelvic resection (LEPR) is defined as an en bloc lateral resection of a pelvic tumor involving sidewall muscle, and/or bone, and/or major nerve, and/or major vascular structure [8]
- With or without stoma formation

Exclusion criteria

- Radical hysterectomy without lateral resection
- Rectal resection only (posterior exenteration)

Methods

All consecutive patients who are planned to undergo pelvic exenteration or laterally extended pelvic resection at Policlinico Agostino Gemelli IRCCS, will undergo ultrasound scan at the time of the pre-operative anesthetic assessment or the day before the planned surgery. A pre-defined case report form (CRF) will be filled by the ultrasound examiner (Supplement 1). The ultrasound characteristics will be compared with the final histology (considered the referral standard).

The ultrasound examinations will be carried out using high-end ultrasound equipment. The frequency of the vaginal probes varied between 5.0 and 9.0 MHz. All examinations will be performed by a specialist obstetrics and gynecology with expertise in gynecologic oncology ultrasound scan. A subjective semi-quantitative assessment of the amount of blood flow within the examined lesion will be made (color score): a score of 1 was recorded when no blood flow could be found; 2 when only minimal/moderate flow could be detected; 3 when very strong blood-flow signals were present.

All patients will undergo pre-operative MRI scan and PET/CT scan.

Pelvic exenteration and laterally-extended pelvic resection will be performed with the aim to remove en bloc the recurrent or persistent disease with a free-of-tumor margin.

Statistical analysis

The sample will be described in its clinical and demographic features using descriptive statistics techniques. Quantitative variables will be described using the following measures: minimum, maximum, range, mean and standard deviation. Qualitative variables will be summarized with absolute and percentage frequency tables. Normality of continuous variables will be checked using Kolmogorov-Smirnov test.

Cohen's Kappa Statistical test will be used to assess concordance between US and histology. Statistical analyses will be performed using the Statistical Package for Social Sciences software (PASW version 26.0, SPSS Statistic, IBM corp., New York, NY, USA). Two-sided tests will be used and the significance level was set at $p < 0.05$.

Sample size

Given the primary objective and the assuming a degree of disagreement of 15%, setting $\alpha=0.01$ and power=80%, the required sample size is $N=85$ [11].

References

1. Fischerova D, Cibula D. Ultrasound in gynecological cancer: is it time for re-evaluation of its uses? *Curr Oncol Rep*. 2015 Jun;17(6):28.
2. Epstein E, Fischerova D, Valentin L, et al. Ultrasound characteristics of endometrial cancer as defined by International Endometrial Tumor Analysis (IETA) consensus nomenclature: prospective multicenter study. *Ultrasound Obstet Gynecol*. 2018 Jun;51(6):818-828.
3. Testa AC, Di Legge A, De Blasis I, et al. Imaging techniques for the evaluation of cervical cancer. *Best Pract Res Clin Obstet Gynaecol*. 2014 Jul;28(5):741-68
4. Kaijser J, Bourne T, Valentin L, et al. Improving strategies for diagnosing ovarian cancer: a summary of the International Ovarian Tumor Analysis (IOTA) studies. *Ultrasound Obstet Gynecol*. 2013 Jan;41(1):9-20.
5. Mascilini F, Quagliozzi L, Moro F, et al. Role of Intraoperative Ultrasound to Extend the Application of Minimally Invasive Surgery for Treatment of Recurrent Gynecologic Cancer. *J Minim Invasive Gynecol*. 2018 Jul - Aug;25(5):848-854.
6. Testa AC, Ciampelli M, Mastromarino C, et al. Detection of central pelvic recurrent disease with transvaginal color Doppler ultrasound in women treated for gynecological malignancy. *Ultrasound Obstet Gynecol*. 2002 May;19(5):490-5.

7. Savelli L, Testa AC, Ferrandina G, et al. Pelvic relapses of uterine neoplasms: transvaginal sonographic and Doppler features. *Gynecol Oncol.* 2004 May;93(2):441-5
8. Vizzielli G, Naik R, Dostalek L, et al. Laterally Extended Pelvic Resection for Gynaecological Malignancies: A Multicentric Experience with Out-of-the-Box Surgery. *Ann Surg Oncol.* 2019 Feb;26(2):523-530
9. Hameeduddin A, Sahdev A. Diffusion-weighted imaging and dynamic contrast-enhanced MRI in assessing response and recurrent disease in gynaecological malignancies. *Cancer Imaging.* 2015 Mar 15;15:3.
10. Hockel et al. *Gynecol Oncol.* 2012 Nov;127(2):297-302
11. Rosner B. *Fundamentals of Biostatistics.* 7th ed. Boston, MA: Brooks/Cole; 2011