

Analysis of Risk-Reducing Salpingo-Oophorectomy (RRSO) with Particular Focus on the Role of Pelvic Magnetic Resonance Imaging (MRI) in the Qualification Process for BRCA Mutation Carriers at the Opole Oncology Center.

Maja Szwiec^{1,2}, Zofia Klich³, Marek Szwiec^{2,4}, Krzysztof Nowak⁵, Aneta Machnicka-Rusek⁵, Maja Mrugała⁵, Mariusz Kasperski⁵, Wiktor Bek⁵, Marcin Kalus⁵, Zofia Borowiec⁵, Ewa Milnerowicz-Nabzdyk⁵, Joanna Tomiczek-Szwiec^{5,6}

¹Wrocław Medical University SKN 1st Department of Gynecology and Obstetrics, ul. Pasteura 1,50-367 Wrocław, Poland

²Clinical Oncology Department of the University Hospital in Zielona Góra, Poland

³SKN of Gynecology and Genetic Oncology Faculty of Medicine, University of Opole, Oleska 48, 45-052 Opole, Poland

⁴Department of Surgery and Oncology, University of Zielona Góra, Zyty 28, 65-046 Zielona Góra, Poland

⁵Clinical Department of Oncological Gynecology at the Oncology Centre in Opole, Poland

⁶Department of Biology and Genetics, Faculty of Medicine, University of Opole, Oleska 48, 45-052 Opole, Poland

Purpose: Patients with *BRCA1* and *BRCA2* mutations are at high lifetime risk of developing ovarian and fallopian tube cancer (*BRCA1* 50-80%, *BRCA2* 31-56%). Prophylactic bilateral salpingo-oophorectomy (RRSO) remains the most effective risk-reducing strategy, lowering the risk by 80-96%. The procedure is usually recommended between the ages of 35-40, taking into account individual factors, reproductive plans, and family history of cancer. Serous tubal intraepithelial carcinoma (STIC), a premalignant lesion, is identified in 2-10% of cases using the SEE-FIM protocol. Standard preoperative qualification includes Ca125 testing and transvaginal ultrasound, with a combined sensitivity of only about 47% in ovarian cancer detection. For this reason, there is ongoing interest in more accurate imaging methods, such as pelvic magnetic resonance imaging (MRI).

Methods: We retrospectively analyzed data from 67 patients with pathogenic *BRCA1/2* mutations who underwent RRSO at the Opole Oncology Center between 2017 and 2025.

Results: Average age of the surgery was 50.02 years. Malignancy was detected in 3 patients (4.48%): ovarian cancer FIGO III (RRSO at age 60), fallopian tube cancer FIGO I (age 65), and borderline ovarian tumor FIGO I (age 48). STIC was identified in one patient (1.32%). Preoperative pelvic MRI was performed in 49 patients (73.1%). No suspicious lesions were detected, including in patients later diagnosed with cancer. Benign-appearing ovarian cysts were reported in 11 patients (22.45%), including all cancer cases. Transvaginal ultrasound did not reveal any suspicious findings. Elevated Ca125 was observed only in one patient with cancer (63 U/ml). The average age of *BRCA* mutation diagnosis was 44.81 years. Breast cancer had been diagnosed in 38 patients (56.7%) before undergoing RRSO.

Conclusions: RRSO remains the most effective risk-reducing procedure for ovarian and fallopian tube cancer in *BRCA* mutation carriers, while also enabling early-stage cancer detection. In this cohort, the average age of surgery was higher than recommended, increasing the risk detecting an advanced-stage cancer. Pelvic MRI did not improve detection sensitivity compared to ultrasound or Ca125, confirming the lack of effective secondary prevention tools in this population. Early genetic testing and offering RRSO at the recommended age remain crucial for reducing cancer incidence.