**МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ**
**БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ**

# М А Т Е Р І А Л И

**106-ї підсумкової науково-практичної конференції**
**з міжнародною участю**
**професорсько-викладацького колективу**
**БУКОВИНСЬКОГО ДЕРЖАВНОГО МЕДИЧНОГО УНІВЕРСИТЕТУ**
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Матеріали підсумкової 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) – Чернівці: Медуніверситет, 2025. – 450 с. іл.

У збірнику представлені матеріали 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) зі стилістикою та орфографією у авторській редакції. Публікації присвячені актуальним проблемам фундаментальної, теоретичної та клінічної медицини.



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**Conclusion.** So, according to our data, the main method of treatment remains the surgical method. For a long time, it was believed that surgical removal of a brain tumor is associated with high risk and complications, but in the last 15-20 years there has been a revolution in the technique of neurosurgical operations. However, surgery is not always possible, for example, due to the too large size of the neoplasm, or due to the location of the tumor in a vital area of the cortex. If surgery is not possible, and after surgery, radiation therapy is performed to destroy tumor cells that may remain in the surgical field. Radiation therapy is selected individually and depending on the cellular composition of the tumor, its size and localization.

**Vasyuk V.L.**

## TWO STAGE HIP REVISION ARTHROPLASTY USING DIGITAL POLARIZATION MICROSCOPY AND INTRAOPERATIVELY PRODUCED SECOND GENERATION SPACERS

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**Introduction.** The results of two stage hip revision arthroplasty depend a great deal on accuracy in differentiating septic component instability from aseptic one. Conventionally, it is based on microbiological assessment of joint aspirate or samples from the wound. The results are available in 8-10 days, and in case of anaerobic infection as late as in 2-3 weeks. Using laser sources for diagnosing the septic instability of hip endoprosthesis components showed spectropolarimetry to have the highest sensitivity, specificity, and accuracy: its sensitivity reached 92-93%, specificity – 82-86%, and accuracy – 88-89%. The result is ready in 1-2 hours. In 2012, new reusable molds for intraoperative production of cement spacers with the antibiotics relevant to the patient's antibioticogram were designed by us. Such spacer contained the antibiotics for which the patient's infection was susceptible, and resembled the shape of a monopolar endoprosthesis.

**Aim of the study** was to improve the results of treatment for septic instability of hip endoprosthesis or its components by using digital polarization microscopy of synovial fluid, and intraoperative production and application of second generation antibiotic impregnated cement spacers in accordance with the patient's antibioticogram.

**Materials and methods.** Differential diagnostics of septic or aseptic nature of the endoprosthesis components was performed by means of complex optical and fluorescent assessment of synovial fluid's polycrystalline structure. The sensitivity was shown to be the highest for circular birefringence Mueller-matrix microscopy of polycrystalline component in synovial fluid. The newly designed technique for hip spacer molding using die molds allows to quickly produce a spacer of exact shape and size during surgery. It is done routinely by scrub nurse, saving the surgeon's time. The spacer's head has perfectly spherical smooth surface. Mechanical strength provided by reinforce wires allows postoperative movements and ambulation. High doses of antibiotics according to the patient's pathogen susceptibility were added to the cement.

**Results.** The improved technique of two stage revision hip arthroplasty was used in surgical treatment of 52 patients. Follow-up results were studied in 49 patients (94,2 %) after two stage hip revision. Infection eradication and good functional outcome was achieved in 89.7%. Their mean Harris Hip Score was 87.18±6.44.

**Conclusions.** 1. A new technique of intraoperative production of second generation cement spacers using the designed die molds was designed by the authors and implemented in treatment of 52 patients. 2. Septic nature of the instability in the endoprosthesis components was diagnosed using circular birefringence Mueller-matrix microscopy of polycrystalline component in synovial fluid. 3. Infection eradication and good functional outcome was achieved in 89.7 %. The mean Harris Hip Score at follow-up was 87.18±6.44.