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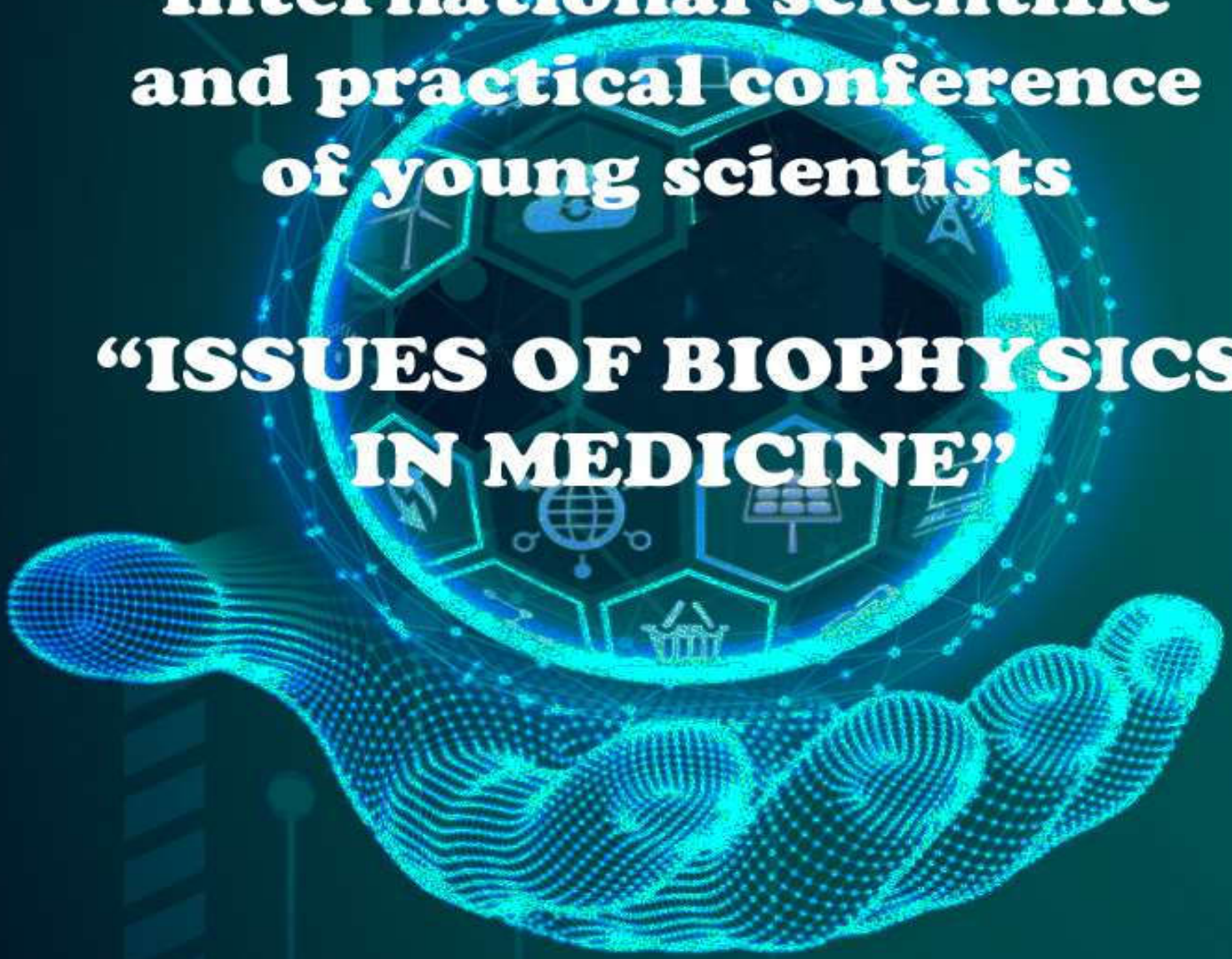
International scientific and practical conference of young scientists

"ISSUES OF BIOPHYSICS IN MEDICINE"



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ABSTRACT BOOK OF THE INTERNATIONAL SCIENTIFIC AND PRACTICAL CONFERENCE OF YOUNG SCIENTISTS “ISSUES OF BIOPHYSICS IN MEDICINE”

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O‘ZBEKISTON RESPUBLIKASI
OLIY VA O‘RTA MAXSUS TA’LIM VAZIRLIGI

O‘ZBEKISTON RESPUBLIKASI SOG‘LIQNI SAQLASH VAZIRLIGI

TOSHKENT TIBBIYOT AKADEMIYASI

“TIBBIYOTDA BIOFIZIKA MASALALARI” MAVZUSIDAGI YOSH OLIMLARNING XALQARO ILMIY-AMALIY KONFERENSIYA TO’PLAMI

TOSHKENT-2023

МИНИСТЕРСТВО ВЫСШЕГО И СРЕДНЕГО СПЕЦИАЛЬНОГО
ОБРАЗОВАНИЯ РЕСПУБЛИКИ УЗБЕКИСТАН

МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ
УЗБЕКИСТАН

ТАШКЕНТСКАЯ МЕДИЦИНСКАЯ АКАДЕМИЯ

СБОРНИК МАТЕРИАЛОВ МЕЖДУНАРОДНОЙ НАУЧНО-ПРАКТИЧЕСКОЙ КОНФЕРЕНЦИИ МОЛОДЫХ УЧЁНЫХ “ВОПРОСЫ БИОФИЗИКИ В МЕДИЦИНЕ”

Ташкент – 2023

AN INNOVATIVE THERAPEUTIC TOOL IN BIOPHYSICS IN THE FIELD OF MEDICINE (LASIK)

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ABSTRACT. Medical procedures called laser therapy make use of concentrated light. Light from a laser—which is short for light amplification by stimulated emission of radiation—is tailored to particular wavelengths, unlike light from most other sources. This enables it to be concentrated into strong beams. Because of its power, laser light may be used to cut steel and form diamonds. Lasers in medicine enable surgeons to operate with extreme accuracy by concentrating on a tiny region, causing minimal damage to the surrounding tissue. In comparison to standard surgery, laser treatment may result in less pain, edema, and scars. However, laser therapy can be pricey and need several sessions. The cornea or eyelid abnormalities or superficial opacities can be treated with lasers. Other applications include creating a capsulotomy and changing the corneal curvature to treat ametropia. The potential harm caused by laser radiation to the eye is outlined. Refractive surgery, often known as vision correction surgery, is an operation to improve your vision. The two varieties are lens surgery and laser eye surgery. According to research, both are secure and efficient. The ideal form of refractive surgery for you will depend on a number of factors, including your eyesight, eye health, age, financial situation, and way of life.

KEYWORDS. *Laser, Strong Beam, Less Pain, Edema, Cornea, Minimal damage, Secure, Efficient.*

INTRODUCTION. Laser in situ keratomileusis (LASIK) is a rapidly evolving ophthalmic surgical procedure. Anatomic complications include corneal flap abnormalities, epithelial ingrowth, and corneal ectasia. Refractive complications include unexpected refractive outcomes, irregular astigmatism, decentration, visual aberrations, and loss of vision. Infectious keratitis, dry eyes, and diffuse lamellar keratitis may also occur following LASIK. By examining the etiology, management, and prevention of these complications, the refractive surgeon may be able to improve visual outcomes and prevent vision-threatening problems. Reporting outcomes and mishaps of LASIK surgery will help refine our approach to the management of emerging complications (1).

A variety of refractive surgery techniques, which reshape the corneal stroma using laser energy, have been marketed as simple and safe alternatives to glasses or

contact lenses. Laser-assisted in-situ keratomileusis (LASIK) is the most common of these procedures. Although there are few high-quality prospective studies of long-term outcomes, complications, or stability for refractive surgery procedures, there is at a least general agreement that more than 90% of appropriately selected patients achieve excellent uncorrected distance vision. In addition to well-recognized contraindications (e.g., unstable refraction, pregnancy, and lactation, chronic eye disease, systemic illness, corneal abnormalities), there are other conditions that warrant caution (e.g., excessively dry eyes, contact lens intolerance, chronic pain syndromes). Vision-threatening complications are rare. Intraocular lenses, implanted following cataract extraction, may be an alternative to LASIK in older patients. Although the overall dependence on corrective lenses is markedly reduced, many patients still require glasses or contact lenses after LASIK, particularly in low-light conditions and as they age. Most patients report satisfaction with the results. Family physicians can help patients make informed decisions by exploring their values, preferences, expectations, and tolerance of uncertainty and risk (2). The laser in situ keratomileusis (i.e., LASIK) procedure reshapes the surface of the cornea to focus visual images directly onto the retina, thereby improving visual acuity (3).

Lasers produce a coherent, focused, monochromatic, high-energy form of light. Because laser surgery is more versatile and precise and is freer of complications than conventional surgery it has become widely accepted in ophthalmology over the past 10 years. Applications range from routine procedures in the fundus to recent, more delicate interventions in the cornea. The argon laser is the most widely used to treat extrafoveal chorionic diseases such as age-related macular degeneration and diabetic retinopathy; it has also been used successfully to treat glaucoma by iridectomy or trabeculoplasty. The krypton red laser is the argon laser's counterpart in the treatment of sub foveal and pigment-epithelium-related diseases. A posterior capsulotomy is the most widespread and successful intervention with the neodymium:yttrium-aluminum-garnet crystal laser; this laser is also used to cut vitreous traction bands and is increasingly used in iridectomy. Although the use of the excimer laser in corneal surgery is still largely investigational it has been shown to produce precise cuts in corneal layers for the correction of myopia or astigmatism. The variable-wavelength dye laser, capable of reaching a specific level in the retina or choroid, has offered exciting new developments, and it promises to soon be part of the ophthalmologist's armamentarium in the treatment of eye disease (4). Lasers are used extensively in ophthalmology for a variety of conditions, including many choroidal and retinal

tumors. With technological advances, current therapy attempts not only to maximize survival with globe-salvaging treatment but also to preserve vision. Each neoplasm has different indications for primary and adjuvant therapy, as well as differing laser treatment protocols. Additionally, there are numerous laser applications available for use, including laser photocoagulation, transpupillary thermotherapy (TTT), and photodynamic therapy (PDT). The current review outlines the basic principles of laser treatment for intraocular tumors, focusing on the indications, treatment protocols, efficacy, and safety, while also presenting the latest advances in intraocular tumor treatment (5).

Femtosecond laser has been introduced in refractive surgery to create a thin-hinged corneal flap without using any blade. The current review was planned to analyze and compare femtosecond-assisted laser in-situ keratomileusis (LASIK), the latest refractive procedure, with conventional techniques in refractive surgery. The analysis showed that femtosecond-assisted LASIK yielded more predictable corneal flaps, lesser ocular aberrations, better uncorrected visual acuity, lesser variations in intraocular pressure (IOP), and fewer chances of developing dry eyes. Transient light sensitivity, diffuse lamellar keratitis, opaque bubble layer, corneal haze, and rainbow glare are some of the demerits of femtosecond-assisted LASIK, but these can be prevented with certain precautions. The early visual rehabilitation and preservation of corneal anatomy are added benefits in the long run. Though it is expensive currently, the competition in the market is expected to cut down the cost soon (6).

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