



## REVIEW ARTICLE

## Concerns of Forensics Expertise in Ophthalmology

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## ABSTRACT

Professionally competent and sworn to court experts - ophthalmologists, for the society recognized as permanently licensed court experts, stand advised in front of the face of medical justice (Hippocratic Oath), with their expertise and knowledge, scientific research in their domain, empirical doctrine and practice, to put the findings and opinion to put conscientiously in court, in accordance with the rights and obligations of medicine and science. Classification of eye injury is defined as heavy or light, without the possibility of categorizing moderate heavy or moderate light injuries and eye diseases. Reduction of environmental activity (ability) - experts should elaborate to the judgment, about the final treatment, permanent sequels, and for certain types of work, activities (work capacity), for which persons are fully or partially capable of performing, or are not in a condition because of causal reasons. According Legislation concept of pain occurs in the form of emotional, and the degree and duration of physical pain, which is causally related to trauma and / or diseases of visual equipment. Court practice has graded entity of disfigurement as disfigurement, cosmetic alterations medium level of cosmetic defects and light degree. Concerns of ophthalmic expertise show that it is necessary to harmonize, to suggest recommendations and guidelines for this complex work so that forensic expertise can become even bigger challenge placed in front of an ophthalmologist, and more effective health and long benefit of patients.

## INTRODUCTION

Doctrine knowledge of the morphological and functional properties of the eye, adnexa, optic nerve, visual pathways and centers, it is important for correct interpretation of the result of injuries and diseases of the eye in the process of forensic expertise.

Modern diagnostic and therapeutic advances in ophthalmology contribute to more adequate work in the field of forensics expertise of ophthalmologist.

Professionally trained forensic experts - ophthalmologists, for the society recognized as permanently licensed court experts, stand advised in front of the face of medical justice (Hippocratic Oath), with their expertise and knowledge, scientific research in their domain, empirical doctrine and practice, to put the

findings and opinion to put conscientiously in court, in accordance with the rights and obligations of medicine and science. Ophthalmologists recognize the knowledge, experience, methods of forensic science, so the base principles of law science and use it to clarify the facts, which are part of medical cases in court through forensic expertise in the legal or criminal dispute, often in the business and self-taught (1).

Global standardization of ophthalmic forensic expertise, although unnecessary, is not universal, but specific in applying individual, dynamic and changing balance during the trial, and now-days in bigger number of hearings. Probably for this reason, even in the world, more accurate and uniform guidelines for ophthalmic forensic expertise do not exist, at least they are not recognized by forensic experts, but they always represent new, complex and difficult chal-

lenge with professional competence, and with a numerous dilemmas.

The ophthalmologist, when he accepts the forensic expertise, for which he is sure to be in accordance with law, to enforce adequate to the end, she chooses the optimal interpretation prescribes of his own and others (team expertise, commissions) forensic expertise available, reference, clinical or other useful information. Often, on the basis of available reference, medical and ancillary documentation, but sometimes insufficient, and when the expert is unable to clinically review the defending party, for justified reasons, whether the patient died (Testamentary expertise), badly injured, uncooperative, not responding to calls, he is then forced to writing and orally present his findings to the needs of the judicial process. Not so rare, it is necessary to submit others personal medical records of recent date, with all available diagnostics and therapy (2).

The frequency of eye injuries in entire eye trauma is about 10%. Injuries (mechanical, chemical, caused by thermal agents, radiation, light energy), or diseases of the eye (glaucoma, cataracts, haemophthalmus, retinal detachment, retinopathy, macular pathology, diseases of the optic nerve and of the visual path), and because of their protruding localization are common and have big socioeconomic significance due to loss of vision, poor prognosis, complications and sequel and extended treatment, so often the so often are subject of forensic, independent and interdisciplinary expertise.

In forensics practice, concern of determination of causal relationship between the injuries and diseases of the eye, which may not always contain complete determination (impossible - 0% as possible - up to 50%, probably - up to 90%, the margin of safety - to 99% and absolute safety - 100%) (1).

In patients with eye diseases, which some time ago suffered an injury, the expert is there to clarify whether the disease is caused by a previous injury, or developed for itself, that is regardless of injury. When classifying eye injury, it is important to determine whether the injured eye was previously healthy or ill (correctly guided medical records) (2, 3).

A large number of eye injuries and help organs takes place at work, in traffic accidents, physical conflict with people, belonging to the dominantly belongs to life-active male population, which is the epidemiological characteristic of this kind of forensic case.

Expertise without personal, clinical examination of patients (eye disease - after 3 months of stopping therapy, and injuries and surgeries for eye damage - earliest 6 months after the procedure, because of the early, late, and those that can be considered permanent consequences) is incomplete and erroneous judicial expertise, which carries a number of omissions, errors of interpretation and judgment, without synchronizing the correlation of previous, current and

future developments in the field of ophthalmic profession for the benefit of patients.

Judicial expert completes analysis of the available facts, for the taken court case, reference medical records and direct examination of the patient, which is an important event, but the final interpretation of the forensic expertise and the court process is made valid by a judge (4).

As the image in the mirror, expertise and judgment of the Court stand. Precise guidelines are not clearly defined, at least in ophthalmology forensics expertise, which represents an additional burden, both in standalone and in multiple forensics expertise, when we need the experts from different fields to put an accent views and findings, for example, in terms of percentage of damage, or, impairment of life activities (skills).

### **Impairment of visual acuity and environmental activities - skills**

Amaurosis, a complete medical blindness is mapped to legal blindness, with a limit 3/60 (0.02) without correction, when visual impairment limits are 0.3 or less, as stipulated by the World Health Organization, effective today in our country.

Categorization of patients with defective vision is carried out 3-6 months after completion of therapy, and opportunities of improvements in order for the forensic expert to be sure that the visual impairment definitely occurred.

Ophthalmologist, concludes and gives his opinion about degree of vision loss on both sides, reduction of visual acuity (destruction, damage, loss), regardless of whether it is monocular or binocular visual function damage or complications. Obliged to interpret both sides, and if preserved visual acuity is found (reference physiological limit - Snellen test) on other healthy or undamaged eye. Congenital or functional organic amblyopia, visual impairments, sometimes are not causal changes related to loss of vision in the eye of the actual expertise and the expert has to make an additional effort to explain concisely and understandably to the parties that do cross-examination in court.

Reduction of environmental activity (ability to satisfy basic life needs of general and special life *joie de vivre*, and are the same for all) experts should explain to the court with information about the final permanent sequels and treatment, and also about the scope of certain types of work, activities (reduction of working capacity - depending on the individual type of job), which are fully or partially carried out, or are unable to perform because of the previously explained reasons. In assessing preserved visual acuity, an expert should be assessed, in addition to visual acuity (tabular value of better and reduce eye function as a percentage, in geometric progression to low visual acuity), the width of the visual field (concentric

narrowing below 30 degrees - 50%, below 20 degrees - 60%, below 10 degrees - 90%, hemianopia, quadrantanopsias, central scotoma of 10-60%), the condition of the accommodation, adaptation to light or darkness, colors and stereoscopic vision. Unilateral aphakia has the loss of visual acuity 15%, and 30% two-sided, while pseudophakia (as more often), 10%, for monocular and binocular 15% of reduction.

Reduction of environmental activities with the loss of one eye is practically functional monocular until the loss of life activities for 5%, if there are no other dominant and systemic losses and damages. The expert is required to explain the percentage of damage, because through the senses of sight, a person can receive 85-90% of information from the outside world. If there are allegations of multiple-trauma, with multi-factorial disorders, then other experts from specified allegations are called to adjust the cumulative collective and yet unique percentage of reduction of working ability. The expert says in which professions of work, hobbies, everyday communications, the patients are suffering because of nonfunctional or less functional state of the eye and the body in general.

Indication for medical intervention is not essential but the expected consequences of the recognized risks of standard medical interventions can't be ignored in repeated forensics expertise.

Disability for work and supplemental actions means that the patient is deprived of the former work, or prequalified, and which represents decreasing of his main incomes for live existence (economic criteria in the area of the court, are not included in this review article).

Concerns of ophthalmic forensics expertise are certainly those, that as the assessment of permanent impairment of life activities as a result of injury or disease of the eye, are proposed to the court as theoretical findings in percentages (table impairment assessment skills by insurance companies), and there are no clear standards and objective criteria. One concern pulls the other, and because of uneven percents, without harmonization of the forensics experts opinion (team, complicated forensics expertise) trials can be prolonged for years.

Third concern refers to a large degree of physical impairment of sight, does not have to represent the complete inability of professional work and other activities, and vice versa.

## Qualification

Qualification of injuries and diseases of the eye is defined as severe (common serious body injury, and qualified serious body injury with permanent consequences) and easy, without the possibility of the emergence of moderate or light injuries and diseases of the eye, with favorable and unfavorable outcome, which requires continuous monitoring, diagnosis and

treatment, as amended ophthalmic expertise, and the two criteria - a danger to life (doesn't actually exist in ophthalmology) and functional impairment of the injuries and illnesses, both here and around the world (5).

An ophthalmologist has realized that severe injuries include: the presence of blood in the anterior chamber, scarred lacrimal duct obstruction, chemical injury, combustions, radiation eye injury grade III and IV, penetrating, penetrating and complex contusion of the eyeball, eyelid avulsion, trauma iris, complicated bleeding (haemophthalmus), dislocations, and traumatic cataract, ischemic edema and physical break - ablation of the posterior segment of the eye, that is retina, macula region, optic nerve, orbital wall fractures, etc.

Multiple trauma and the presence of foreign bodies, whose consequences may be the loss of an eye, extracting principles, complications and postoperative clinical status are individual and multi factorial, and must be interpreted in the doctrine, relying on experience, theory and practice of ophthalmologists - the operator, as well as specialized consulting teams.

Eye injuries qualified as minor injuries are bruising and emphysema surgery, lacerations and the wound eyelids, lacrimal duct disruption, lacerations, bruises and conjunctiva foreign bodies, foreign bodies and corneal erosion, contusions of the eyeball, chemical injury, and combustions and electric eye injury grade I, II and others.

Many ophthalmic diseases consecutively formed, that is diseases cause effect relationship with the current clinical status of the patient, as well as the causal connection between the injury and the resulting consequences are required to be written in for of statement with the ophthalmic expertise.

Besides of the classification of the resulting injuries or diseases, the expert shall explain, connect, or eliminate connections through the mechanism of the injury or illness, the causes and nature of progression or stagnation, favorable or unfavorable prognosis of injuries or disorders of the eye. Current expert imposes a fundamental question - how to interpret the effects of the injury at the time of application, by itself in most people, and what are the effects of injury in this particular example. The consequences of injury depend on internal factors (immune status, condition, systemic, metabolic, neo-disease, etc) and external factors - the type of cause (6).

## The degree and duration of pain

Under the definition of pain in the legal domain is considered an aspect of health damage, as occurs in conjunction with body injury, in this particular case, eye. Consequential non material damage refers to damage caused in the subjective sphere of the patient and according to the Legislation it appears in the form of emotional, and the degree and duration of

physical pain, which is a causal connection between the trauma and / or disease of the visual apparatus, but with individual differences (provoked by injury or disease, spontaneous, intermittent or continuous pain).

The degree of physical pain, which is characterized as hard, usually occupied by a strong to strongest analgesics administered within a few hours to 24 hours (with continuous chemical injuries and secondary glaucoma after injury). Pain in the middle range can be time consuming, and highly variable, as is depending on the clinical case, in the period from 1 week to 1 month, 1 year and more. Pain of light intensity does not have to exist, or is permanent, on the other hand, due to acute and daily, after the regular, routine ophthalmic examination, inspection and consultation by other specialists. Pain represents a subjective feeling of the degree of tissue damage and has a vague limit of individuality, so experts often turn to their clinical experience. Pain control is immeasurable unit, that is, value, which can't be measured and graded, but eliminate or postpone, that is, controlled with a constant or variable intensity. Physical pain that medicine can notate is strong to the weak, and it is now an incomplete grade in Ophthalmic interpretations, so it certainly represents a possible ambiguity in the ophthalmic and joint expert opinion (with otolaryngologists, neurosurgeons, vascular, plastic and general surgeons, surgeons of orthopedia surgeons, gynecologists, urologists, pediatricians, dentists, dermatologists, internists, etc).

In poly-trauma pain is common and represents a cumulative effect in terms of intensity and duration, as well as a unique feeling and the assessment of the final treatment of eye injuries and diseases. Lasting pain is presented when mobility, in metereophats, routine clinical control, is recommended as a factor of findings for impairment of life activities.

Mental, psychological pain, the fear (type, intensity of duration, primary, secondary) is outside the scope of ophthalmological forensic expertise and belongs to analysis of other referent professions - neurologists, psychiatrists, psychologists and related forensic expert.

Pain has no market value (price), and the interpretation of the consequences suffered by physical pain, as well as forensic expertise of medical error today (7) reflects in adequate, for now, optimal monetary compensation in free evaluation of the judge and the court.

## Disfigurement

Definition of disfigurement involves modification exterior appearance (scar sequel, atrophies, etc) harmony of the body, head and eye, or function causing negative psychological and other effects, patients and indirect-directly their environment.

The degree of eye disfigurement and a close eye regions of the face (eyebrows, eyelids, adnexa) and anatomical environment of the eyeball, is listed as heavy, medium or light, and the same can be progressive or less progressive thrive and dominate the clinical evolution, with favorable or unfavorable prognosis, esthetics and general status of the patient.

Concerns of legal entities is that the case law is graded disfigurement as disfigurement - contort of high level, medium level of esthetic alterations of disfigurement and cosmetic defects - esthetic disfigurements of light degree, and with no precise criteria, with or without personal admission of an expert ophthalmologist.

## Other in references

Less often it is necessary to make the appropriate and / or by court required changes in first forensics expertise, and the first expert is faced in so-called super-expertise with an expert in the same field, or related, more referent institutions outside the parent institution in a specific the court case.

For these and other reasons, it is necessary to lead the diagnosis of injuries and / or disorders of the eye in Latin and Serbian (maternal) language, for better understanding of the so-called super-expertise from all stakeholders present at required court hearings. Clinical findings of forensic expertise at the time of injury or acute eye disease, varies in clinical areas from a later, permanent or variable-existing ophthalmic expert opinions.

Cases of interest were evaluation by characters of traumatic impact and time of medical injury and the surgical interventions. By standardized (ophthalmological and other) methods, it is concluded that such interesting cases require forensic medical expertise (8).

Review articles are devoted to analysis of expert errors made in course of implementation of the Medical Criteria for estimation of harm to human health. Errors of primary expertise of harm to human health due to misapplication of Medical Criteria were either revised or corrected (the results of primary expertise were confirmed) (9). What will the court choose, as proof or, is it interesting case of mutually exclusive evidence? Such considerations lead to the known dilemma: "evidence or proof" (10)?

Many authors propose to divide the process of forensic medical examination of medical malpractice cases into several stages and substantiate the possibility of the realization as the form of situational forensic medical expertise (11).

Same authors report the results of analysis of rights of participants in judicial proceedings (the prosecution and the defense) to appoint and carry out forensic medical expertise in course of the criminal court process (12, 13).

Eye injuries were mostly caused by mechanic trauma. Pathological changes of fundus were the important factor affecting the vision functions. The injury causing instruments, injury sites and medical history of eyes should be considered while evaluating the actual visions (14, 15).

Bluvshtein suggests the method for estimating the net cost of the forensic medical expert investigation, consisting in calculation of objective real coefficient of the ratio of various expert investigations to the reference value. The ratio between forensic medical investigation budget and the total number of these investigations forms the basis for estimation of the net cost of the expert evaluation (16).

## CONCLUSION

Communication skills are an actual condition of a good and productive expertise in correlation of medical and legal sciences. The forensic expert ophthalmologist must have the theoretical knowledge and certain skills to complex problem of litigation or guilt in the field of ophthalmic specialty, adjust the courtroom environment, and that all conscientious interpretation and dialogue are understandable to all stakeholders. Expertise, impartiality and truthfulness are requirements imposed to be fulfilled by forensic expert of ophthalmological profession.

The forensics experts reasonably and honorably claim financial reward for their work, and often the same fee is not returned. Competent omissions are certainly one of the concerns in the system forensics expertise, which is to be on time and properly resolved.

Concerns of ophthalmic expertise show that it is necessary to harmonize and recommend policies, recommendations and guidelines of the complex, that it becomes an even greater challenge placed in front of ophthalmologists, more effective health benefit for patients, and non adequately rewarded and organized work of forensic expert, with all of his obligations and rights.

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