

Результаты. Анализ локального контроля внутриглазной меланомы у 10 больных, которым проводилась предоперационная брахитерапия, показал, что у 9 больных размеры опухоли после брахитерапии не изменились, у одного больного был отмечен продолженный рост внутриглазной опухоли на 1 мм. При проведении хирургического вмешательства с помощью радиоволнового ножа нами не было отмечено случаев интраоперационных осложнений. Контрольное двухмерное ультразвуковое исследование на 7-9 день после операции показало, что ни в одном случае не было обнаружено остатков опухоли и наличия отслойки сетчатки. У 14 из 23 больных на десятый день после операции удалось сохранить достаточно высокую остроту зрения от 0,1 до 1,0, у остальных 9 из 23 больных причиной снижения зрения явился остаточный отек роговицы и незначительный гемофтальм. Спустя 6 месяцев после операции у 15 из 23 больных острота зрения составляла от 0,2 до 1,0. У 8 больных причиной снижения зрения были частичное и диффузное помутнение хрусталики, а также дистрофия роговицы. Эти изменения наблюдались как у больных, которым проводилась брахитерапия, так и у тех, кому ее не проводили. В наблюдаемые сроки нами не от-

мечено рецидива опухоли и наличия дистантных метастазов.

В качестве примера результатов радиоволновой хирургии представляются фото (рис. 1-3).

Заключение. Анализ предварительных клинических результатов показал, что использование высокочастотного радиоволнового ножа «Surgitron» при биоэксцизии меланом иридоцилиарной зоны и хориоидеи позволило уменьшить риск возникновения интраоперационных и послеоперационных осложнений и, следовательно, сохранить высокие зрительные функции у 15 из 23 больных, что улучшает качество жизни пациентов.

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EFFICACY OF RADIO-WAVE SURGERY IN TREATMENT OF MELANOMAS OF THE IRIDOCILIARY ZONE AND CHOROIDS (PRELIMINARY RESULTS)

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Analysis of the results of surgical treatment was made in 31 patients (aged 56 ± 9.2) with melanoma of the iris, ciliary body and choroidea (21 women, 10 men). In 19 cases melanoma was located in the iridociliary zone (extension of the tumor was (5.04 ± 2.0) mm, prominence — (2.4 ± 1.5) mm) and in 12 cases — it was located in the iris, ciliary body and choroidea (extension of the tumor was (9.8 ± 1.0) mm, prominence — (6.2 ± 1.7) mm). The use of high frequency radio-wave surgery allowed to decrease considerably the risk of development of intra-operation and postoperative complications and, thus, to preserve high visual functions in 15 of 23 patients.



Рационализаторские предложения

A STEP BACKWARDS CAN BE A STEP FORWARD — NEW PERSPECTIVES FOR SLIT LAMP PHOTOGRAPHY

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Introduction. The slit lamp is approaching its one hundred's birthday. While its wide range of magnification, the flexibility of the slit beam and the option of colour change are used in nearly any eye examination, the plane of sharp focus — being at approximately 10

cm in front of the objective — seems to be out of question and has been untouched for many decades [1]. We showed earlier that by placing a minus lens of e.g. — 8 dpt in front of the objective of the slit lamp its plane of sharp focus can be shifted further away and also a face

may be photographed [2]. In this paper we describe how this «step backwards» can be used effectively not only for portrait and squint photography but also for scanning of external findings making a video slit lamp — by few modifications — a true «all-round»-instrument ready for documentation of nearly all abnormal conditions occurring in ophthalmology.

Methods. Slit lamps were developed for biomicroscopy of the eyeball and its adnexae [3, 4, 5]. At the plane of sharp focus with the lowest magnification an eye fills major parts of the examination-field [6]. If the patient moves away from the chin-rest the picture fades leaving the examiner with a blurred view comparable to that of a myopic person with a farpoint at about 10 cm (equivalent to — 10 dpt refraction).

We can correct this «refractive error» of the slit lamp by holding a minus lens in front of its objective (Figure 1) and obtain a fairly sharp picture which can even stand the comparison to a picture with a classical digital photo camera. If the patient is at a distance of approx 50 cm we have to add -8 dpt (= -10+2), if he is at 25 cm we have to add -6 dpt (= -10+4) and so forth (see Figures 2). The relevant finding is that we obtain different angles of view which may serve as a basis for different purposes of clinical photodocumentation in ophthalmology.

The pictures — like all others in this paper — are taken by the inbuilt CCD-camera of the slit lamp (Zeiss, SL 105) and are stored on a compact flash-card as a JPG-file using a videoprinter (Panasonic MPD 7).

In practice an ophthalmological examination has to cope with blinding, blinking and unrest of the patient — especially in children [7]. Also sometimes the major clinical finding is only visible for parts of a second. We therefore record a video-sequence on an S-VHS-recorder (Panasonic, NV-HS850) or a HDD-recorder (Panasonic DMR-EX95V) during the examination and afterwards select the appropriate pictures using the slow motion- and singlestep-mode [8].

Results — clinical applications. As it is the principle aim to condense visual information for effective use especially for ophthalmological practice we found it suitable to «tell as much as possible in one image» [9]. Using today's methods of treating digital photo material [10, 11] offering an album function we can easily create picture arrangements on a computer screen with different purposes and store them as a JPG-image: Figure 3 shows an example of a 2x2 arrangement for a patient after resection of basal cell carcinoma. This image contains both classical anterior segment photography with the slit lamp (bottom right) and pictures where a minus lens is used. Figure 4 A shows a 9 gaze composite which is favourable for binocular problems [12]. Also functional aspects of squint may be photographed as can be seen on picture 4 B in a case of long standing trochlear palsy. Here the corneal light reflexes are generated by the diffused slit beam itself, which is rotated left, decoupled and realigned by

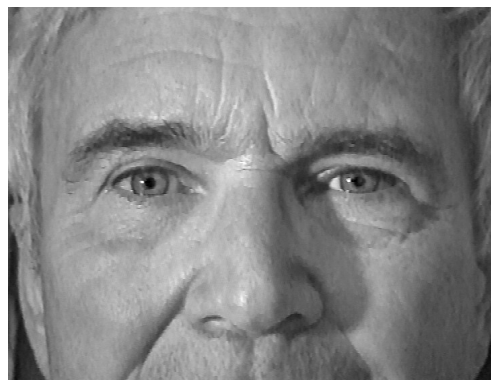
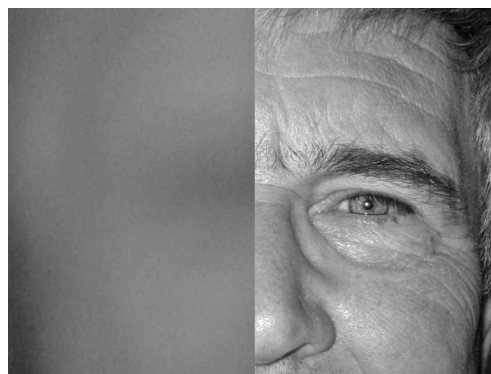


FIGURE 1: View from the side showing the patient at a distance of 50 cm from the objective of the slitlamp in front of which the examiner holds a — 8 dpt lens in his left hand

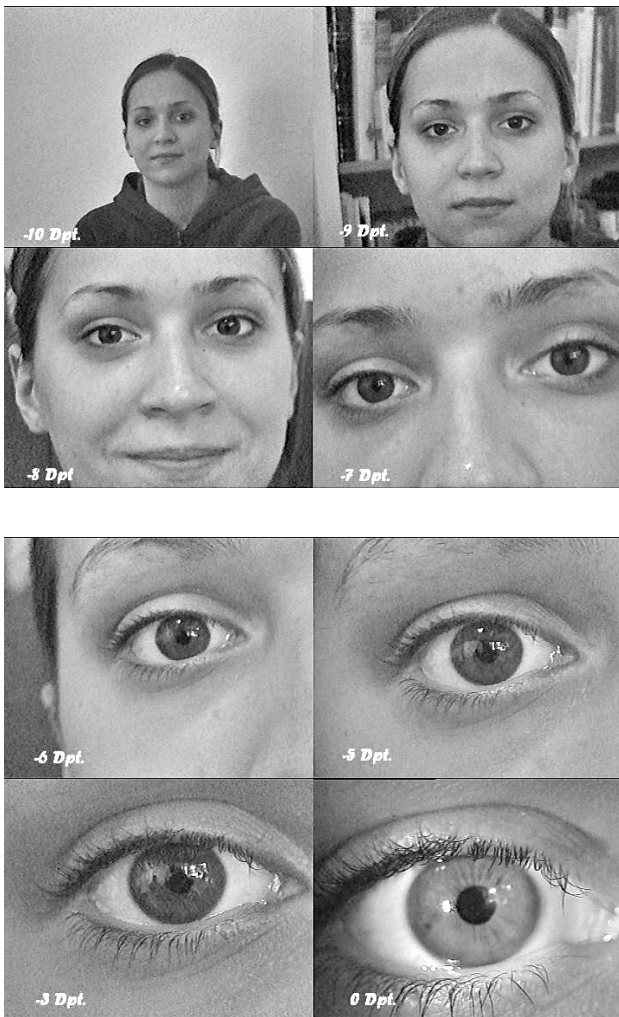


FIGURE 2: Effects on the angle of view of different minus lenses (-10, -9, -8 and -7 dpt) held in front of the objective of the slitlamp — with adjusted distance of examination



FIGURE 3: Patient after resection of basal cell carcinoma from left inner lid angle. (upper row with — 8 dpt lens, bottom left with — 5 dpt and bottom right without additional lens). There is also opacification of left cornea after penetrating injury in the past

a prism [13]. Another use of the album function is shown in Figure 4 C where the effect of head tilt on position of eyes can be easily demonstrated in another patient with Brown's syndrome of the right eye. We want to point out again that also this pictures is only made by using a video slit lamp (with a correcting -9 dpt lens and the patient at approximately 1 m from the objective).



FIGURE 4 A: 9 gaze composite of a 4 year old girl with Brown's syndrome of right eye. (All pictures with a — 8 dpt lens held in front of the slit lamp objective and additional 1.6 magnification.)



FIGURE 4 B: Patient with long standing palsy of left trochlear nerve. Bielschowsky sign positive (upper row right) and characteristic head tilt. In this case illumination of the patient only came from the diffused slit beam itself producing easily visible corneal reflexes. (All pictures except bottom right with — 8dpt lens and additional 1.6 magnification, bottom right with — 10 dpt lens)

If we do not only challenge the idea of the «fixed focus» of the slit lamp but also question the point that a slit lamp should only be used for photography of an eye it is a small step to use the slit lamp technique in its original form or with an appropriate minus lens (according to the size of the object) to «scan» other photographic material. We simply place the photographic object in an appropri-

ate plane of sharp focus which will largely be determined by the mere size of it (Figure 5 A old photography, Figure 5 B neuroradiological scans).



FIGURE 4 C: Composite of nine different positions of head in a patient with Brown's syndrome of right eye. (All pictures with a — 9 dpt lens held in front of the slit lamp objective.) From this picture it is evident that torsion of the head to the left side is advantageous for binocular vision.

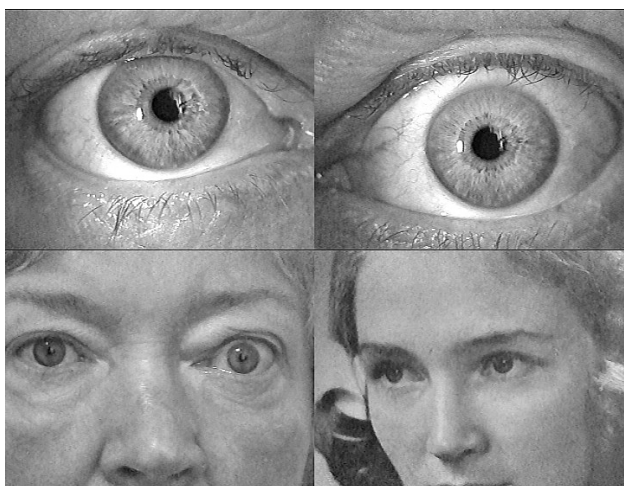


FIGURE 5 A: 65 year old patient with mild Grave's disease: Upper row classical slit lamp anterior segment pictures, bottom row left using — 7 dpt lens and bottom right «scan» of 40 year old picture from driving license for comparison

We store clinically relevant JPG-images in the practice software, having them available in the right place without delay of time — see Figure 6. (For clarity of terminology we distinguish between the single picture as taken from the video-sequence and the final image which is stored as one JPG-file. Thus a JPG-image may consist of just one but also of several single pictures.)

Discussion. The slit lamp was invented at the beginning of the 20th century to visualize anterior and middle segments of the eye more accurately [3]. Our contribution to an even more comprehensive use of the video slit

lamp is the introduction of minus lenses in front of the objective [2].

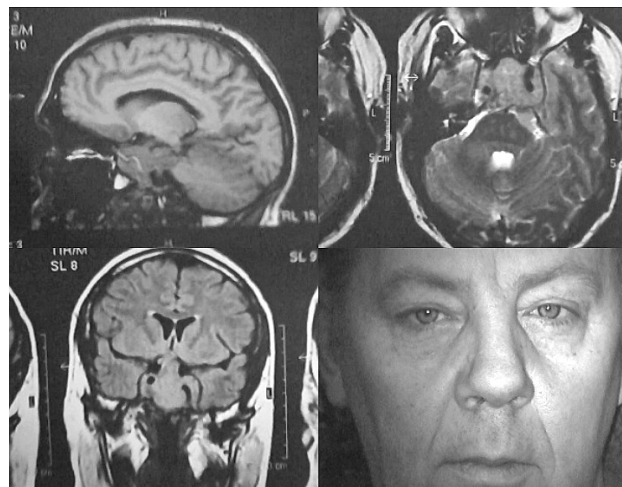


FIGURE 5 B: Composite of 3 pictures of «slit lamp scans» (using — 7 lenses and additional 1.6 magnification) selected from more than hundred single neuroradiological images on a print out. The patient suffered from prolaktin-secreting pituitary adenoma causing bitemporal hemianopia. Upper row left sagittal section, upper row right horizontal section, bottom row left coronal section. The photograph of the head was taken with a — 8 dpt lens held in front of the slit lamp objective



FIGURE 6: Four years sequence of photodocumentation in a girl with congenital esotropia clarifying the idea of photo-ophthalmology: The JPGs are stored in the computer system and clicking on an icon means having the picture available without delay of time on a full computer monitor. Photo-ophthalmology means transforming as many relevant clinical findings in as few pictures as possible for any ophthalmological disease.

According to the correction of the myopic situation of the slit lamp and the adjusted distance of examination a different width of the angle of view may be selected (see Figure 2). In our case — 8 dpt is suitable for a full face view with the patient 50 cm away from the objective of the slit lamp. This is particularly helpful for strabological photography (see Figures 4 A and B) and disorders of lid position like ptosis, but also for tumours of the face

(see Figure 3) [13]. Other lenses may be appropriate for different entities: e.g. - 9 dpt for head tilt (Figure 4 B and C) and - 6 dpt for changes in the periocular region, e.g. xanthelasma [12, 14, 15]. For practical purposes -4 dpt or lower power do not offer relevant additional information to the normal slit lamp picture (sharp focus at approx 16 vs. 10 cm). But at each new plane of sharp focus the inbuilt additional magnification (for good results in our hands up to 1.6) of the slit lamp may be used (see Figure 4 A and 4 B).

To our knowledge this procedure has just been recently described [2]. The principles in general may be applied to just any slit lamp model because of their common basis of construction [1]. Only small, but important, adjustments of examination scenery are necessary: Sufficient light for portrait-photography [16, 17] may be obtained from day light or the broad diffused slit beam itself, if it is de-centered and realigned to the face examined with an appropriate prism (see Figure 4 B and Figure 5 B bottom right) [13]. The apparent disadvantage of the slit lamp being largely fixed to a table makes it necessary to move the examination chair in sufficient distance and height to the slit lamp objective. Prismatic effects, however, related to the high power minus lenses used for portrait photography can be used by anyone familiar with this technique to make final but important adjustments of the position of the examination field.

Despite the difference in the respective photographic techniques described they can all be performed quickly by simple changes of the use of additional lenses and need no further shift of the patient and no change of surrounding, which may be particularly helpful for children [18, 19] and is certainly an advantage to bringing in new photographic equipment. Also we avoid the typical «atmosphere of photography» which may be annoying for the patient and the examiner.

Not only is it an attractive idea that the central instrument in daily work can be used for «wide angle photography» at sufficient quality [20]. Onto that which can already be visualized by the slit lamp the «scanning function» contributes still another world: We started to use it for scanning of patients' passports-pictures (see Figure 5 A) and old photos and recently expanded it also for radiological scans (see Figure 5 B), amsler-charts, angiograms, HRT- or OCT-printouts and even specimens of handwriting in cases of dyslexia. To our knowledge examples for that kind of «scanning» with the slit lamp have never been given before. It is done so quickly that it should be considered as a possible application for daily practice although classical scanners and digital photo cameras can produce superior photographic quality to that which can be realized with our method [2].

In order to minimize loss of photographic quality by movement and irritation of the patient and the examiner and other irritating influences we suggest that a video-sequence is taken during the examination with the option to select the best pictures afterwards using the

slow motion- and singlestep-mode [8]. This not only avoids the need to communicate to the patient and his relatives at the time of choice of final pictures but also offers the chance to delegate final picture acquisition to a second person being familiar with the importance of clinical findings and thus saves the examiner's time.

The expansion of digital photography and the broad availability of software programmes in the developed world offer entirely new perspectives for documentation [11, 21, 22].

Storage capacities of 35 Gb and more — available on a Rev-Disk (derived from «revolutionary»!) to secure data — make it possible to integrate 200.000 JPG-images of approx. 100-150 kB each (as in the images presented here) into a practice software. In fact it is this step from a conventional archive of printed pictures to the storage of JPGs in computer-files [23] which made us report on our vision of a comprehensive «photo-ophthalmology» based on pictures taken by a video slit lamp (see Figure 6).

With digital storage information being easily available at low costs pictures may be evaluated on screens with much bigger size than in the photo print-days [11] which is the comfortable basis for using picture arrangements as we suggest it here. Of course especially for reconstruction of fundus images [9, 21] and also for strabological documentation [12, 24] arrangements have long been in use, but the need to use scissors and glue made it a laborious work. With digital work up, however, there is an enormous gain in speed of the procedure [8, 11].

We use the 3x3 pattern of arrangement for 9 gaze images (see Figure 4 A), but also for photodocumentation of panretinal diseases e.g. after retinal operations, for diabetic patients especially after photo-coagulation and diseases like retinal vein thrombosis or chorioidal melanoma [8]. While in the 3x3 pattern single pieces are brought together to get a new meaning, we find the 2x2 pattern a good balance between concentration of information and sufficient clarity of detail and regard this format — although it may appear arbitrary [1] — as a challenge to tell much of the patient's condition on a computer monitor (see Figures 3, 4 B, 5 A and B). The 2x2 pattern is also particularly helpful for direct comparison between right and left eye (e.g. pupillary disturbances or optic nerve in glaucoma) — see also Figure 5 A upper row) [25].

The «language of pictures» can be understood not only by eye specialists, but also by general practitioners and patients in all parts of the world. It may also be used in its electronic form — as digital image via the internet — for immediate exchange of clinical assessments. Photodocumentation gives the clinical case «an individual face» and helps to memorize specific aspects around a person.

We started with a step backwards and left the path of using the slit lamp mainly for anterior segment and occasional fundus photography [8, 26]. Our old instru-

ment, which will celebrate its one hundred's birthday soon and seemed all so familiar to us, surprised us with new perspectives. Why not carry this way further and replace much of what was formerly written down in words by few meaningful pictures. Especially those ophthalmologists without access to a professional photography unit, could establish an inexpensive, practicable, comprehensive and still very effective concept of clinical documentation based on a slitlamp — we call it «photo-ophthalmology».

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