Clinical Arrangement of Classification of Diabetic Retinopathy

MASATOSHI FUKUDA

Department of Ophthalmology, Faculty of Medicine, University of the Ryukyus, Yogi, Naha 902, Japan

Fukuda, M. Clinical Arrangement of Classification of Diabetic Retinopathy. Tohoku J. exp. Med., 1983, 141, Suppl., 331-335 — A new classification for diabetic retinopathy was presented and modified from Scott's classification which was most commonly used in Japan. Diabetic retinopathy was divided into benign and malignant retinopathy, and the former was named type A and the latter type B. Type A included background retinopathy and the interrupted stage of proliferative retinopathy. Background retinopathy was divided into two groups (AI, and All). Interrupted proliferative retinopathy was also divided into three groups (AIII, IV, and V). Type B included preproliferative retinopathy, advanced proliferative retinopathy and the final stage of proliferative retinopathy. Preproliferative retinopathy was labeled Stage BI and advanced proliferative retinopathy was divided into two groups (BII and BIII). The final stage of proliferative diabetic retinopathy was divided into three stages (BIV, BV and VI). This new classification also presents the therapeutic method to be employed at each stage of diabetic retinopathy.

Many classifications of diabetic retinopathy have already been introduced in many countries but no one classification has the support of all clinicians. The choice of a good classification for diabetic retinopathy poses a serious problem for all diabetic clinics, because it is useful in discussions between physicians and ophthalmologists in the selection of treatment. The author would like to introduce a new classification in which an indication of all therapeutic methods for diabetic retinopathy is assigned. This stage classification is a modification of Scott's classifications, 1953 the most commonly used at present in Japan.

Principle of Classification

Most ophthalmologists support the theory that diabetic retinopathy can be divided into benign retinopathy and malignant retinopathy. The latter develops from the former and is certain follow on from the stationary or interrupted stage sooner or later. The major part of benign retinopathy has been denominated simple diabetic retinopathy or unproliferative diabetic retinopathy or background retinopathy. Malignant retinopathy has been denominated proliferative retinopathy, but the interrupted stage of proliferative retinopathy is not malignant, because it is not aggravated.

In this new classification, benign retinopathy included background retinopathy and interrupted proliferative retinopathy. Malignant retinopathy and the aggravating stage of...
proliferative retinopathy must be identical in this classification.

**Benign Retinopathy**

Benign retinopathy was classified as type A, and was divided into 5 stages. Background retinopathy was divided into stages AI and AII. Stage AI has microaneurysms and punctate blot hemorrhages as its fundamental lesions. Stage AII shows large blot hemorrhages and punctate hard exudates. The interrupted stages of proliferative diabetic retinopathy were divided into three stages. Stage AIII includes stationary neovascularization with no soft exudates and no retinal or vitreous hemorrhages. Local retinal edema and confluent hard exudates with neovascularization may also be classified in this group, if neovascularization does not worsen over a one year period. Stage AIV patients are distinguished by residual vitreous hemorrhage during the last year but with no new hemorrhaging occurring over the next year. Stage AV is an interrupted proliferative retinopathy with no aggravation occurring within a year.

**Malignant Retinopathy**

Malignant retinopathy was classified as type B, and was divided into 5 stages. Pre-proliferative retinopathy and Stage BI must be considered as an identical stage. Stage BI has the intraretinal microvascular abnormalities, soft exudates, diffuse retinal edema and superficial retinal hemorrhage. Some well-developed cases of stage BI show the slightest indication of new vessels, which can only be recognized using fluorescein fundus angiography.

The advanced stage of proliferative diabetic retinopathy was divided into stages BII, BIII, and BIV. Stage BII has an obvious new vessel which can be anywhere in the fundus and which is not connected to the optic disc. This is the early stage of proliferative diabetic retinopathy by ophthalmoscopy. Stage BIII shows neovascularization directly connected to the margin of the optic disc. Venous abnormalities and peri-papillary retinal edema will often be seen at this stage and if papillo-edema or especially, diffuse peri-papillary retinal edema are present, special attention must be paid to the possible development of rapid progressive retinopathy which is the worst type of diabetic retinopathy. Stage BIV is distinguished by vitreous hemorrhage during the last year.

The final stage of proliferative diabetic retinopathy was divided into Stages BV and VI. Stage BV is neovascularization which is elevated into the vitreous cavity with fibrous proliferation. Stage VI shows retinal elevation caused by traction of fibrous proliferations. Malignant retinopathy, as mentioned above, included preproliferative retinopathy, and the advanced stage and final stage of proliferative diabetic retinopathy.

Moreover, Sign M is established in this classification. It is considered as maculopathy and this lesion can be found in either type A or B.
DISCUSSION AND CONCLUSION

This new classification has two main points stippen to discussion. -the correct classifications for interrupted proliferative retinopathy and pre-proliferative retinopathy.

First, interrupted proliferative retinopathy does not aggravate, not does it require any special treatment, provided systemic conditions do not take a turn for the worse. It is wise for clinicians to separate this stage from the other aggravating stage of proliferative diabetic retinopathy. This stage must be classified alongside benign retinopathy clinically.

In the interrupted form, there were no soft exudates or blot hemorrhages around the new vessels, and this can be used to differentiate between the active and stationary forms. The interrupted form also differs from the active form in that no worsening occurs in the interrupted form in the same fundus.

Patz5), Davis and other many ophthalmologists insist that pre-proliferative retinopathy must also be given independence from other forms of diabetic retinopathy. In the author's opinion, pre-proliferative retinopathy should be treated separately to background retinopathy, but it must be included under the classification of advanced stage proliferative diabetic retinopathy.

Pre-proliferative retinopathy is certain to be aggravated to proliferative retinopathy within 6 months if the systemic condition is not improved and no photocoagulation is performed on these fundus. It must, therefore, be considered as the earliest manifestation of proliferative retinopathy. It is true that some intraretinal microvascular abnormalities are not followed by new vessels — these cases were first detected as early leakage of fluorescein by fluorescein fundus angiography. In the more common form of pre-proliferative retinopathy, however, intraretinal microvascular abnormalities are followed by a very slight indication of new vessels. These new vessels are different to the obvious new vessels found at Stage BII, and are not detectable by ophthalmoscopy. In the author's clinical experience, the best indication of retinal photocoagulation was the stage of pre-proliferative retinopathy. In this classification, therefore, pre-proliferative retinopathy was included in malignant retinopathy and classified as Stage BI.

The simpler the classification of disease, the better. It is not necessary for background retinopathy to be subdivided into more than two stages, or for interrupted proliferative retinopathy to be subdivided into any more than three stages.

The aggravating stage of proliferative retinopathy was divided into five stages according to the growth of new vessels. The main pathological signs of proliferative retinopathy are neovascularization and fibrous proliferative lesions. In dividing proliferative retinopathy, however, growth of proliferative tissue was not taken into account, because neovascularization is the root cause of all the
aggravations and proliferative tissue is only a secondary factor related to the new vessels.

Stage VI is the final stage of aggravated proliferative retinopathy. Retinal detachment or retinoschisis are the worst complications found in diabetic retinopathy, such as neovascular glaucoma and ischemic optic neuropathy.

Complicating maculopathy causes diminution of vision and retinal detachment, glaucoma and optic neuropathy which can result in complete blindness. Maculopathy, therefore, is classified as Sign M and independent of type A and B.

This new stage classification is to be used in assessing the therapeutic implications of diabetic retinopathy. The treatment for the diabetic retinopathy can be established according to its stage in this classification. Table 1 shows the list of treatments currently in use for the different stages of diabetic retinopathy.

References


Clinical Arrangement of Classification of Diabetic Retinopathy

