Staff Meeting Bulletin
Hospitals of the » » »
University of Minnesota

Ophthalmoscopic Aspects of Some Local and Systemic Vascular Diseases

Volume XIV | Friday, February 5, 1943 | Number 14

STAFF MEETING BULLETIN
HOSPITALS OF THE . . .

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William A. O'Brien, M.D.

I. LAST WEEK

Date: January 29, 1943

Place: Recreation Room
Powell Hall

Time: 12:15 - 1:30

Program: "Adenoma of Bronchus" - Thomas Lowry

Discussion:

Leo G. Rigler
N. Logan Leven
O..H. Wagensteen
K. W. Stenstrom
James J. Waring (University of Colorado)

Attendance: 109
Gertrude Gunn,
Record Librarian

II. MEETINGS

1. ANATOMY SEMINAR

Saturday, February 6 at 11:30 a.m. in room 226 Anatomy, "Peripheral Pathways for Visceral Pain".

C. Van Buskirk.

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2. PHYSIOLOGY-PHARMACOLOGY SEMINAR

Tuesday, February 9 at 12:30 in room 214 Millard Hall, "Ulcer--A Chemical Problem".

Owen H. Wangensteen.

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3. BACTERIOLOGY SEMINAR

Thursday, February 11 at 4:30 p.m. in room 214 Millard Hall "Bacterial Photosynthesis".

Mary Muedeking.

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4. ST. PAUL SURGICAL SOCIETY

Thursday, February 11 at 7:30 p.m. at the Minnesota Club. "Impressions Concerning the Treatment and Results of Treatment of Acute Appendicitis, Appendical Abcess, Appendicitis with Generalized Peritonitis at Ancker Hospital (E.M. Jones), Minneapolis General Hospital (A.A. Zierold) and University of Minnesota Hospitals (Clarence Dennis).

III. STAFF MEETING NOTICE

The following suggestions are offered to expedite staff meeting procedure. Luncheon will be served from 11:45 - 12:15, meeting will be held from 12:15-1:15. In order to keep the room darkened and to eliminate corridor noise both large side doors will be kept closed during the meeting. Those who must come late or leave early should use the steps in the rear of the room through the service kitchen. Please keep this passageway free.

When the meeting is called to order at 12:15 those who must leave during the early part of the meeting should move their chairs to the back of the room. This should be done during the reading of the announcements. As most essayists will have finished their paper by 1:00 those who do not have to report back to duty before 1 o'clock should remain seated during the presentation of the report.

Latecomers should not use the lobby for social purposes. The arrangement with the Powell Hall authorities does not include the use of the lounge. Latecomers should enter the staff meeting room through the door in the service kitchen. Chairs will be placed in the back of the room for their use.

The various departments go to considerable time and trouble to prepare interesting and instructive reports. Most of the departments cooperate by not requiring their staff men to be engaged during the hours of 12:00 and 1:00 on Fridays the regular school year. As emergengies will arise, it will not be possible for everyone to stay during the entire meeting and exceptions will always be made

Successful meetings depend upon audience participation in the form of interest, attention and discussion. Disturbances are created by the thoughtless few who gossip with their neighbors during meetings, indulge in loud conversation in the corridor or those who wander in and out at any time. Visitors to our meetings must not b impressed by the informal way in which we conduct them.

I am sure that most of us find the reports of such value that we would like to hear them without unnecessary interruption.

IV. Staff meeting next week will be held Thursday, February 11 because Friday, Feb. 12, is a University Holiday.

OPHTHALMOSCOPIC ASPECTS OF SOME LOCAL AND SYSTEMIC VASCULAR DISEASES
(Lantern Demonstration)

Ferdinand L. P. Koch, M.D.

The question of caliber size limits of arterioles of the retina has not received exhaustive discussion in the literature. Casual mention has been made when the subject was pertinent to intraocular pressure relationships and to essential hypertension and, then, usually only with reference to arteriolar topography in general rather than to local arteriolar calibers and distribution. Arterial vessels ranging in external diameter from 20 to 150 microns probably should be considered as arterioles. There would fall in this category then the main retinal arteriolar trunks together with their primary, secondary and the majority of their tertiary branchings. The inferior and superior papillary arteries not infrequently seen on the optic nerve-head in reality are arteries and not arterioles. This is confirmed clinically, for example, in those hypertensive states in which marked, residual sclerosis and narrowing of the arterioles has ensued subsequent to healing or absorption of the retinitis that accompanied acute angiospasticity such as might have occurred in eclampsia or in acute vasospastic hypertension in the male or female. In such an instance the papillary arteries ophthalmoscopically retain their original caliber even at the height of the brachial diastolic elevation. Their color tends to remain essentially normal; however, the entire retinal arteriolar tree, and beginning immediately distal to the papillary arteries proper, exhibits more or less profound hypertensive pallor and brilliance, sclerosis and reduction of caliber. These changes, of course, are more readily observable in the retina than elsewhere because the ophthalmocope enable them to be seen directly.

The normal wall-to-lumen ratio of the retinal arterioles is about 1:10 while that in the renal and cerebral arterioles is approximately 1:7. This ratio is variable but is less in other organs and, in the myocardium, is nearly 1:4. Incidentally, in hypertensive disease it now seems evident that the higher the ratio the more marked are the pathologic changes in the arteriolar walls and the more does the ratio then tend to be lowered. The myocardium apparently seems to undergo less actual damage to its arterioles than is seen in other organ vessels of a similar order of external caliber size elsewhere in essential hypertension.

The majority of the arterial vessels near the macular area are 20 or more microns in caliber while those immediately adjacent to, and within, it usually are narrower than this figure. Thus, the latter should be considered capillaries. There is little doubt that dilatation of capillaries as well as of smaller arterioles probably does occur in the course of abnormal vascular pathology. It should be recalled, however, the "tortuosity" of retinal vessels is a term that was introduced by the older workers who employed indirect ophthalmoscopy. This procedure entailed the examination of much of the eyeground as a whole but the observed picture was minified as compared with our greater magnification today with direct ophthalmoscopy. Thus, normal undulatoriness of the vasculature of the retina frequently was exaggerated to the point of appearing tortuous and, since few distinctions were made within the general category of "cardiovascular renal disease", "tortuosity" became a casual byword rather than a term to be used with care. Arteriolar disease frequently may, and does, result in some degree of venous stasis locally in the retina sufficient to cause impediment to return venous flow together with coincidental and subsequent capillary stasis or slowing. Mechanical dilatation of previously minimally visible arteriolar capillaries will come about and this again results in some tendency to low-grade tortuosity of these small, easily distensible vessels. It tends to occur more frequently, however, in patients with chronic, benign (so-called red) hypertension and in atherosclerotic (arteriosclerotic) patients with normal

or relatively normal systemic blood pressures. These latter are the persons more prone to retinal and cerebral apoplexy; however, these episodes also occur in severe hypertensive states.

There seem to be no particular branches or segments of any arterioles in the retina that are peculiarly susceptible to manifestations of local or generalized arteriolar hypertonicity; however, localized angiospastic constrictions clinically are inclined to favor somewhat the nasal arteioles and their branches as primary sites of manifestation. Generalized, smooth, retinal arteriolar narrowing or attenuation of caliber with or without ophthalmoscopic evidence of progressive chronicity or of localized or segmental constrictions occurs typically in primary hypertensive disease. It is only in later phases when sclerosis and the subsequent wall and lumen irregularities occur as the result of the continued maintenance of the abnormal vascular status quo that progressive renal ischemia may be thought responsible for the accelerated increase of pressor substance to produce a further, superimposed intermittent or continuous acute angiospastic stimulus that accounts for the localized arteriolar constrictions observable in the later, more severe phases of the antecedent, somewhat "benign" primary hypertension.

It is of value to develop an appreciation of the dynamics, both physiologic and pathologic, of the intraocular manifestations of systemic diseases. This entails a comprehension of the broad basic principles of the intraocular pressure relationships from the point of view of the inter-relation, three dimensionally, of the responses of the anatomic structures to the stimuli of local and general physiologic processes and to relate these again to the pathologic alterations that therefore are potentially possible. It is necessary to recognize the existence of the relatively wide normal variations in size, color and configuration and that these variations in the eye grounds are minute and not gross; unless this is done it is too easy in clinical practice to think in terms, for example, of a-v ratio and "tortuosity", and of "albuminuric retomotos" among others. Such terminology conveys little if any idea of etiology, pathogenesis, suggested therapeutic measures or of prognosis.

If the retinopathy still known as "albuminuric retinitis" observed in some instances of hypertensive cardio vascular renal disease is considered as angiospastic it becomes possible to effect a classification of retinitis that permits relatively accurate evaluation in individual instances. The association of retinitis with changes in the retinal arterioles necessitates the recognition of these changes. Ophthalmoscopically, smooth and uniform attenuation of caliber represents hypertonicity or increased vascular tone. Medial hypertrophy, or "chronic" sclerosis is indicated by increased visibility of the wall together with variations in color such as the classic "copper-wire" and "silver-wire" appearance. The arteriolar-venous compressions (so-called "hicking") and deflections are aids in determining the degree and distribution of the sclerosis. Angiospasm is evidenced as localized constriction or "beading" in the arterioles. Active spasticity is recognized usually by decreased visibility at the site of constriction while increased visibility is present if repeated spasticity or chroncity has existed.

So-called "albuminuric retinitis" is considered to be angiospastic retinitis and always is acute in onset. Acute angiospastic retinitis may occur with or without chronic sclerosis of the retinal arterioles. Its occurrence in association with chronic sclerosis indicates the presence of diffuse arteriolar disease with hypertension, but where sclerosis is absent the presence of acute angiospastic retinitis is seen in chronic glomerulonephritis, in acute vasospastic disease with hypertension and in hypertensive toxemia of pregnancy.

"Arteriosclerosis" (essentially degenerative, or atheromatosis) most frequently is representative of earlier

or concomitant venous thrombosis. The latter usually is a manifestation of pathologic alterations in the veins. Arteriosclerosis may occur as a more chronic phase of a previously existing recurrent angiospastic retinitis of premalignant hypertension. Venous thrombosis may occur as the result of a local venous inflammatory process even if arteriolar sclerosis is present; however it usually is seen in patients with arteriosclerosis or with hypertension. The central vein of the retina or one of its branches may become occluded and, ophthalmoscopically, the picture is one of retinal hemorrhagic infarction. The reverse is true when there occurs a closure of the central artery of the retina or of one of its branches when ischemic infarction will be observed. Fragmentation of the blood stream either in the arterioles or in the vein or in both will occur in the earlier phases together with ischemic edema of the retina. A cherry red spot will be found typically when the central artery is occluded although this redness may not be manifest if the closure occurs in a very darkly complected patient. Atrophy of the retina together with a type of secondary optic atrophy of the nerve-head as well as atrophy of the choroid ultimately will occur in association with blindness.

Diabetic retinitis in its earlier phases consists primarily of one or more small punctate hemorrhages usually together with discrete or coalescent waxy yellowish exudates, but with no ophthalmoscopically obvious changes in the retinal vessels; however, it is thought that there is some alteration in the capillaries. Diabetic retinitis may and does occur in association with hypertensive disease which then is manifested by the prescence of cotton-wool exudates, flam-shaped hemorrhages, and chronic arteriolarsclerosis. Venous damage tends to appear in the later phases when diabetic retinitis has existed for some time. This venous damage essentially is degenerative and frequently gives rise to mural thrombi. Repeated hemorrhages into the vitreous may result in retinitis proliferans.

The retinopathy of anemia secondary to chronic glomerulonephritis not infrequently is accompanied by attenuated arterioles, as well as by thin grayish cotton-wool exudates and pale hemorrhages of varied shapes together with a pallid nerve-head. The latter picture when encountered in the anemias associated with avitaminosis, lymphatic leukemia, pernicious anemia and advanced carcinomatosis also together with relatively dialted retinal vessels which tend to approximate each other in color differs again from anemias with low platelet counts in which the hemorrhages tend to be rather thick or "purpuric" in character. White-center hemorrhages are thought to occur with more frequency in leukemia particularly of the myelogenous type than in the ordinary types of anemia and probably are due to the relatively greater concentration of white cells in the blood. Leukocytic infiltration frequently is visible in chronic myelogenous leukemia as whitish fluffy patches immediately paralleling venous walls. These are more prone to occur in the retinal periphery and frequently will be seen in association with hemorrhagic infiltration marginating these leukocytic infiltrations. The veins in chronic myelogenous leukemia almost always are very markedly dilated while the arterioles also exhibit some degree of dilatation. The relatively pale anemic color of the blood in the retinal vessels in these instances is diagnostically helpful and is in strong contrast to the cyanotic appearance in general in the eye grounds in plethoras such as polycythemia vera. The pale thin hemorrhages that occur in the course of vitamin deficiencies subsequent to decreased food intake in conditions of persistent vomiting or of chronic alcoholism frequently are seen diffused in a sheet-like manner adjacent to, or on, the disk.

Septic retinitis most typically is seen in association with subacute bacterial endocarditis in which hemorrhages of various sizes and shapes (some of which may have white centers and may appear together with cotton-wool patches) will occur. When the blood culture is repeatedly negative in such instances diffuse lupus erythematosus should be considered. Cotton-wool patches and

occasional hemorrhagic areas occasionally will be encountered in individuals who present septic fevers of unknown origin. Most frequently in these instances there will be no accompanying or manifest vascular disease.

VI. GOSSIP

To the range to speak at the annual staff meeting of the Hibbing General Hospital. The institution was opened just one year ago on February 3. It was formerly one of the clinic hospitals with a mine contract. The clinic had dissolved partnership so new hospital plans were made. The building was turned over to the Sisters of St. Benedict for operation. This is an unusual institution in many respects. All of the treatment, diagnostic and operating room facilities are on the first floor. The obstetric unit is in a separate wing. The pediatric section is unusually large for a hospital of 150 bed capacity. Range families are large and illness in children is more satisfactorily cared for in an institution. The obstetric service had 500 deliveries last year. The traumatic surgery section is large. Like all other Benedictine hospitals which develop in the Duluth area, hospital records receive a great deal of attention. Trained record librarians are supplied from the combined course at St. Mary's Hospital and Villa Scholastica in Duluth. Post-mortem examinations are also stressed, and the service here is in charge of Dr. George Berdez. The new Hibbing Hospital secured permission in 86% of deaths last year. The pediatric section had 153 children with the diagnosis of pneumonia. Dr. Bert Adams chief of staff during the past year gave an excellent account of his stewardship. When the Hibbing General Hospital was opened, the other local institutions closed in order to concentrate all of their work in one place. As one goes about the state, one finds the older men carrying on in every community and busier than ever. They must continue to function while the lost battalion of younger medical men serve elsewhere. The number of younger men left in Minnesota outside of the metropolitan areas will not be further reduced as the cities will be asked to supply men for the military services during the coming year. At the close of the war the younger men now in service will have to be absorbed rather slowly in order that their training programs may be completed. The outlook for those in practice at the present time is certainly a frozen job for several years to come. Word that he has been appointed commanding officer of a 3,000 convalescent hospital at Fort McPherson, Georgia, has just been received from Colonel Edward Spencer Murphy, known as "Murph" to most of you. Included with the announcement was a double folder with two pictures of the military one. The first was taken 25 years ago and the second within the last month. It is an interesting study of how lightly the years have touched him. It would almost appear that he was doing a little bragging as not many of us could have pictures taken at 25 year intervals and expose them to critical view. The course in internal medicine at the Center for Continuation Study was an unqualified success. The program was planned with the idea of presenting some of the newer concepts in internal medicine. The advance prospectus for the Yearbook in Internal Medicine contains a list of the outstanding features for that publication. Believe it or not, we had included 90% of these titles in our course. One of the features in the orientation discussion on the first day is to emphasize three points: first, there are some subjects which we will present on which we are better informed than any member of the group; second, there are many subjects about which our knowledge is identical; third, there are some subjects on which a member of the group will be better informed. As a result of our offer to come forward and help out, Major Thomas N. Horan, Medical Corps, Army of the United States, volunteered that he had some experience in peritoneoscopy and liver and kidney biopsy. He had his movie with him and his demonstration was easily one of the outstanding features of the program on that day. His experience with these procedures ran into the thousands. We had the same experience in one of the Kenny courses when two of the public health surgeons (Armstrong virus experts) came forth and told us of their experiences. Twenty-three states were represented in the course in internal medicine. Stuart C. Cullen in charge of the department of anesthesiology at the State University of Iowa will be a University guest instructor next week in the course in anesthesiology. There

is a great interest in this field at the present time largely because of many new developments. Pre- and post-operative care is another fascinating field. The maintenance of physiologic balance on the operating table is also essential. Our group in surgery has been active in this field. Dr. Alfred Blalock, professor of surgery and director of the department of surgery at Johns Hopkins Hospital will give the 10th annual E. Starr Judd Lectureship in Surgery on Thursday, March 11 at 8:15 p.m. in the Museum of Natural History Auditorium. His subject will be "traumatic shock with particular reference to war injuries". He will also serve as guest instructor that week at a course in surgery at the Center for Continuation Study.