

CHAPTER VI.

DISEASES OF THE SCLEROTIC.

Hyperæmia—Episcleritis—Ulceration—Sclero-choroiditis anterior—Wounds and Injuries—Tumours.

HYPER-
ÆMIA.

The "Sclerotic zone."

Denotes
intra-ocular
disease.

HYPERÆMIA OF THE SCLEROTIC.—When describing the anatomy of the eye, p. 2, I mentioned that the conjunctiva is supplied with a superficial and deep set of vessels, and that these form a ring of anastomosis round the circumference of the cornea, from which vessels are given off, which perforate the sclerotic and anastomose with those of the iris and choroid. This latter set of vessels is known as the "sclerotic zone of vessels," or "the arthritic ring;"* and which is situated in the subconjunctival tissue; it is frequently made apparent by congestion, when the circulation in the internal structures of the eye is deranged, it becomes a most valuable indication of the vascular condition of the intra-ocular parts. (See Fig. 2, Plate III.) Unless, however, in diseases of the cornea, iris, or choroid, the congested "sclerotic zone" is seldom or never seen: if, therefore, we are to consider the appearance of the "arthritic ring" as an indication of hyperæmia of the sclerotic, we must admit that the latter pathological condition is but rarely observed in practice, except as a complication of alterations in the neighbouring structures.

The importance of this fact can hardly be too

* The term, "arthritic ring," has been applied by some pathologists to a narrow white ring sometimes seen between the cornea and the vascular zone, and which was formerly supposed to be characteristic of rheumatic or "arthritic" inflammation. This is, however, not the case, nor has the appearance any diagnostic value.

strongly insisted on. From a large observation of cases, I can safely say I know of no symptom in diseases of the eye more commonly overlooked or misunderstood than that of the sclerotic zone of vessels. Cases are constantly sent to me as suffering from scleritis, or keratitis, whereas the real seat of the disease is either in the iris or choroid.

Often mis-
understood.

In all doubtful cases of the kind it is extremely desirable to apply atropine to the eye, and watch its action on the pupil, which will frequently be found to dilate irregularly, from the presence of synechia, the result of iritis, and if so, all difficulty in the diagnosis will be cleared up. The atropine can do no harm, even supposing the condition to arise from some other affection of the eye, and as a test of the participation of the iris and choroid in the disease, it is invaluable, especially to those who are not in the constant habit of examining patients suffering from diseases of the eye.

Atropine
a test of
iritis.

EPISCLERITIS.—We occasionally meet with cases, especially among adult females, in which *parenchymatous formations* of a limited character take their rise in the sclerotic. A patient affected in this way presents himself to us with a dusky-red or reddish-yellow elevated spot in the sclerotic, probably as large as a split pea or bean, usually situated on the inner or outer side of the globe, near the insertion of the recti muscles. There is generally some slight conjunctivitis over and around this little nodule in the sclerotic. The patient seldom complains of pain or inconvenience beyond a slight stiffness in the movements of the eyeball; nevertheless, in some cases, especially those subject to rheumatism, the patient complains of intense neuralgic pains extending from the affected eye over the side of the temple, with considerable photophobia. The protuberance feels hard, precisely as if a small fibrous tumour were growing from the sclerotic; the part is vascular, but the rest of the eye may be perfectly healthy.

EPISCLERITIS.

Raised and
red spot on
sclerotic.

No pain.

Some of these cases may be traced to a syphilitic taint, the hypergenetic process in the sclerotic resulting in the formation of a gummy tumour of small size, pursuing the same course as similar growths do in other parts of the body, and under these circumstances the growth in the sclerotic is likely to recur after it has disappeared for a time.

"Gummy"
character.

Progress slow.

The progress of episcleritis is very slow, often lasting for several months; but it has a natural tendency to recovery, and will in time disappear, unless stimulated to increased growth by the injudicious application of caustics and similar agents to its surface.

Treatment.

Iodide of mercury.

No local application.

Treatment.—The eye should be kept at rest with a pad and bandage, and, as a general rule, iodide and bromide of potassium combined with bichloride of mercury, and a generous dietary, will hasten the removal of these parenchymatous growths. Local applications are not often required, but Mr. Soelberg Wells thinks that a solution of chloride of zinc, $\frac{1}{4}$ of a grain to an ounce of water, gradually increased to gr. ij to the $\mathfrak{z}\mathfrak{j}$, is useful; and I have no doubt that a solution of atropine (gr. ij to the $\mathfrak{z}\mathfrak{j}$) dropped into the eye once or twice a day is beneficial, especially in cases attended with neuralgic pain over the temple and in the affected eye.

ULCERATION OF SCLEROTIC.

ULCERATION OF THE SCLEROTIC.—Mr. Bowman has described a peculiar form of this affection as “small, intractable ulcers of the sclerotic,”* and I have lately met with a case of this kind. The patient was in bad health, the ulcers occurred in succession in both eyes, and were situated near the cornea; they looked as though a small piece of the sclerotic had been punched out; and in the right eye they extended so deeply into the sclerotic, that ultimately it was perforated. The disease was of a most obstinate nature, and the patient suffered considerably from pain in the eyes, intolerance of light, and profuse lachrymation.

SCLERO-CHOROIDITIS.

SCLERO-CHOROIDITIS ANTERIOR.—By this term is understood an affection of a limited portion of the choroid and sclerotic tunics, which may or may not be inflammatory in its origin, but which results in the adhesion, wasting, discoloration, and ultimate bulging of the parts from intra-ocular pressure. Sclero-choroiditis anterior is said to be “partial,” when only a portion of the sclerotic between the cornea and equator of the eye is involved; it is “complete” when the whole circumference of the globe is involved, the diseased action being in by far the majority of cases con-

* Bowman, “Parts concerned in Operations on the Eye,” Appendix, p. 109.

fined to the region of the ciliary body and processes. In the complete form of the disease, the sclerotic is extensively degenerated, and at the same time the intra-ocular pressure is increased, so that the anterior part of the globe is forced forwards, the diseased sclerotic yielding before the increasing tension of the globe; the front of the eye thus becomes forced more or less from the orbit, projecting, it may be, so far forwards as to interfere with the closure of the eyelids. Some greatly dilated ciliary vessels appear on the surface of the projecting sclerotic, or *Staphyloma* as it is called. Thinning, and bulging of sclerotic.

Sclero-choroiditis anterior may arise:—1st, From primary degenerative changes, involving the vessels and fibrous tissue of the parts, including the sclerotic; 2nd, From inflammation of the ciliary body, a portion of its structure being destroyed. In this case the sclerotic in the immediate vicinity not only suffers directly from the effects of inflammation, but also from a diminished supply of nutriment and secondary degeneration, in consequence of the disease of the ciliary body; fatty degeneration occurs, it gradually yields to the intra-ocular pressure, and a staphyloma results. 3rd, Sclero-choroiditis may arise from the effects of an incised wound over the region of the ciliary body. Causes and varieties.

1. In the first class of cases there are no prominent symptoms to mark the advent or progress of the disease;* the structural changes are gradually established, probably commencing with disease of the choroidal vessels of the part, upon which fatty degeneration of the dependent tissues supervenes. These become disintegrated and removed, with the exception of the pigment cells, which seem to resist these changes, and are left isolated and adherent to the sclerotic. Degenerative. Vascular atrophy.

I before mentioned that the sclerotic is mainly dependent upon the vessels of the choroid for its nourishment; as, therefore, these changes progress in the ciliary body, the sclerotic covering the part ceases to obtain sufficient nutrient material to maintain it in a healthy state; fatty degeneration occurs, and the diseased portion of the sclerotic, being no longer able to Gradual wasting of sclerotic.

* “Maladies des Yeux,” par M. Wecker, vol. i. p. 246.

resist the intra-ocular pressure, gradually yields to it, and bulging outwards, forms a protuberance over the region of the ciliary body (Fig. 20). The size of the tumour of course depends upon the extent of the degenerative changes that have taken place.

FIG. 20.



Staphyloma formed.

Dark grape-like protuberance.

Progress slow or arrested.

Vitreous and lens degenerate.

2. Inflammatory.

Begins as irido-choroiditis.

Secondary degeneration of sclerotic.

A staphyloma of the sclerotic thus formed is of a dark bluish colour, often almost black, on account of the pigment cells of the ciliary body having become intimately attached to its inner surface, and their colour being seen through the attenuated sclerotic. This form of disease often makes but very slow progress, and may become stationary at any period of the patient's life; but if irritation and congestion are excited in the neighbouring structures, the parts already prone to disease undergo further changes, and a considerable portion of the ciliary body, and of the sclerotic covering it, may become involved in the morbid action. In this case the nutrition of the vitreous and lens is apt to suffer, the former becoming fluid and flocculent, the latter more or less opaque, so as greatly to interfere with the perfection of vision. Under more favourable circumstances, these cases, of what may be called degenerative sclero-choroiditis anterior, do not materially damage the patient's sight.

2. In instances of sclero-choroiditis anterior, originating in inflammation of the ciliary body, precisely the same pathological changes ultimately ensue, and result, as in the previous variety, in the formation of a staphyloma. The early symptoms, however, are those of irido-choroiditis; the congested sclerotic zone of vessels exists, indicating abnormalities in the intra-ocular circulation; there is pain in the eye, increased on pressure over the inflamed ciliary body, and intolerance of light; haziness of vision from opacity of the vitreous follows; and there is marked increase of tension of the eyeball. The symptoms often run a subacute course; but from effusion taking place into the part, the choroid is apt to be torn away from the sclerotic; or from damage done to its vessels during the inflammation, degenerative changes often progress rapidly in the latter structure, and as I have above

described, in cases not originating in inflammation, it gradually yields to the intra-ocular pressure, and a staphyloma occurs. This bulging of the sclerotic may be of very considerable size, so much so as ultimately to project forwards between the eyelids and impede their movements, or even prevent their closing. In instances of this kind the retina becomes detached, and the eye totally destroyed. On the other hand, if the staphyloma does not reach any very considerable size, and a sufficient quantity of healthy choroid is left to supply nourishment to the vitreous and lens, the patient may retain a very fair amount of vision for a time; but in too many cases of this description exacerbations of the disease occur, ending in destruction of the eye.

3. In instances of wounds dividing the sclerotic over the ciliary region, a hernia of a portion of the ciliary body may take place through the incision, and unless the case is speedily brought under treatment, the intra-ocular pressure not only forces the edges of the wound apart, but protrudes more of the ciliary process through it. This extruded portion becomes, in the course of time, covered by fibrous tissue, so that a staphyloma is formed, the inner surface of which is lined by the remains of the ciliary body or choroid, according to the position of the original wound. In consequence of the irritation and stretching to which the parts are exposed, subacute inflammation is established, and progressive degenerative changes, such as I have already described in other cases, set in; more of the sclerotic may, in this way, be involved, until at last a very large staphyloma is formed.

In instances of this description, unfortunately, the damage is not confined to one eye—the irritation is too frequently propagated from the injured eye to the sound one, and unless the source of irritation is removed, the patient will very probably lose his sight altogether.

From whatever cause a staphyloma of the sclerotic may arise, it follows, if the protrusion be a large one, surrounding perhaps the whole or a greater part of the circumference of the eye, that extensive changes must occur within the globe. Hence we notice in cases of this kind that the iris becomes altered in colour, the lens often opaque and more or less dislocated, the

Staphyloma.

Sight may be lost.

3. Traumatic.

Ciliary hernia.

Adventitious coating.

Resulting staphyloma.

Implication of the other eye.

Deep-seated changes.

vitreous watery, and the depth of the anterior chamber is greatly increased. In fact the eye thus affected becomes almost completely disorganized.

Treatment.

Rest and protect the eye.

Improve the general health.

Subdue inflammation.

Abscission; when expedient.

If traumatic,

remove protrusion.

Treatment.—In the degenerative form of sclero-choroiditis anterior, but little can be done to cure the essential disease, which often depends upon a scrofulous or lymphatic diathesis. Much may be effected, however, in the way of preserving the eye from further damage, by warning the patient of the danger he runs from over-exerting it, and of the necessity there is for protecting it from external injury and from the glare of the sun, and, in fact, of taking all possible care of the diseased organ. In this way the structural changes may be prevented from making further progress, especially if at the same time the patient's general health and nutrition can be improved by a change of circumstances and appropriate regimen. Any depressing influences are likely to tell upon the weak point, and as surely the sclero-choroiditis will then advance steadily onwards.

If the affection depends upon inflammatory changes, our treatment must be mainly directed towards the mitigation of the primary cause of the disease; and as a means to this end we shall probably resort, among other measures, to paracentesis or iridectomy; but for further details on this subject, I would refer to the chapter on irido-choroiditis. When once a staphyloma has formed, the eye will require every care and attention, on the part of both surgeon and patient, in order to prevent a recurrence of the inflammatory action and an increase of the staphyloma. If, in instances of this description, the staphyloma is of considerable size, and the sight of the eye destroyed, there can be no two opinions as to the propriety of excising the anterior part at least of the diseased eyeball (abscission). If this is not done, the irritation going on in the part may very probably lead to sympathetic irritation in the other eye, while its removal will save the patient much annoyance and inconvenience.

In the third class of cases, if the wound of the sclerotic is of recent origin, and a portion of the ciliary body is protruding through the wound, it is advisable to put the patient under the influence of chloroform, and a Weiss's stop-speculum having been adjusted, the extruded choroid is to be snipped off, and the sclerotic

edges of the wound carefully brought together, and retained in apposition with a fine suture. The eyelids should subsequently be closed, and the eye kept at rest with a pad and bandage. We may possibly in this way prevent the formation of a staphyloma, and the sclero-choroiditis attending it.

If the case, when first brought to our notice, be of long standing, it will be well not to interfere, provided the staphyloma is of no great size, and the patient retains some amount of sight. But if the vision is destroyed, and the staphyloma is a large one, the sooner abscission of the eyeball is performed the better.

Another consideration must also guide our practice in such cases. Sympathetic irido-choroiditis, as I have elsewhere explained, is a most insidious and dangerous form of disease, and is what we have most reason to fear in cases of sclero-choroiditis arising from wounds of the sclerotic. I have no hesitation, therefore, in saying, that supposing the sight of the injured eye is partially retained, but the vision of the sound eye gradually becomes impaired, or symptoms of irritation in the cornea or deeper structures make their appearance, extirpation or abscission of the injured organ must be insisted on at once; any delay, under these circumstances, may end in total loss of sight in both eyes. On the other hand, by removing the diseased eye in time, we may reasonably hope to stop the further progress of the malady in the sound one, the effects of which we shall never be able to cure if allowed to run its course.

WOUNDS OF THE SCLEROTIC.—Incised wounds of the sclerotic are by no means of common occurrence, the part being so well protected by the bony walls of the orbit. When an injury of the kind does occur, we seldom see a hernia of the choroid (as in the case of the ciliary body) on account of the intimate nature of the connexion that exists between the choroid and the sclerotic. The retina, however, under these circumstances, is generally torn through, and a portion of the vitreous escapes; the torn edges of the retina are apt to get entangled in the wound, and as the latter cicatrizes and contracts, the retina is dragged from its attachments to the choroid, and the patient's sight is destroyed.

I lately saw an instance of the kind in a lad who

Close by suture.

Except in old cases.

Sympathetic irido-choroiditis.

Endangers sight.

Necessitates immediate extirpation.

WOUNDS OF SCLEROTIC.

Retina involved in the cicatrix,

And displaced.

Case.

had been struck by a piece of percussion-cap on the outer part of the eye; the sclerotic had been torn open, and the wound had subsequently cicatrized. At the time I saw this boy, some few months after the accident, the eye appeared healthy; but on dilating the pupil with atropine, I found that the retina stretched across the posterior concavity of the eye, like a curtain in the vitreous chamber, having been drawn into that situation in the way I have described. The sight of the eye was of course completely destroyed.

As I have mentioned in the preceding page, we should if possible bring the edges of an incised wound in the sclerotic together with fine sutures as soon as possible after the injury, especially if the wound is not a large one, and no very considerable portion of the contents of the globe have escaped.

RUPTURE
OF SCLEROTIC.

RUPTURE OF THE SCLEROTIC.—This accident may occur from a direct blow on the eye, inflicted with a blunt instrument, or the closed fist, or from a fall. In cases of this description, the sclerotic is most commonly burst open at its upper or inner part, near the margin of the cornea, or between the cornea and the insertion of the recti muscles.

A blow on the eye, sufficiently severe to rupture the sclerotic, necessarily affects the other structures contained in the eyeball, and at the instant when the sclerotic bursts open, the lens is usually forced out through the wound, dragging the iris, and often a portion of the choroid, away with it. The vitreous may also escape, and, in fact, the eye too often collapses, and is totally lost.* In less severe cases the retina may be detached from the effects of the concussion, or from the bursting of some of the choroidal vessels, and the hæmorrhage which then takes place behind it. Under these circumstances, the anterior and vitreous chambers may become filled with blood, and it will be impossible to ascertain exactly the lesions that have taken place in the fundus of the eye until the blood has become absorbed.

Escape of
lens,
and vitreous.

Retina
detached.

Hæmorrhage.

CON-
TUSIONS.

SIMPLE CONTUSIONS of the sclerotic, apparently of a trivial nature, are at times followed by remarkable changes in the vitreous. Probably, the circumstance

* See several cases reported by Mr. Hulke: *Ophthalmic Hospital Reports*, vol. i. p. 292.

of the injury is forgotten, and the patient consults the practitioner for gradual loss of sight, usually complaining also of dark objects waving about before the field of vision. On examining the eye with the ophthalmoscope, we shall find that the vitreous is fluid, and small brown or black specks may be seen floating about in it. It is evident that in these cases the vitreous body has gradually lost its consistency, in consequence of some impairment in its nutrition, determined by the blow; and the retina, having lost its normal support, is in danger of becoming detached, and the patient's sight destroyed.

Vitreous
may be-
come fluid,

And retina
detached.

Prognosis.—The prognosis to be formed in instances of severe wounds or injuries of the sclerotic, is, as a general rule, very unsatisfactory. Even in slight cases, complications such as I have above indicated, consisting of detachment of the retina, or degeneration of the vitreous, may occur, and damage the sight. Lastly, injuries of this description are likely to involve the choroid, entailing remote ill consequences, as I shall subsequently explain when speaking of diseases of that structure.

Prognosis
unfavour-
able.

Treatment.—In a case of rupture, if no great amount of the vitreous has escaped from the wound, its edges must be brought together by means of fine sutures, and the eye kept at rest till the wound has healed. But if the lens and a considerable portion of the vitreous have escaped through the opening in the sclerotic, it will be well to allow the globe to collapse, the eye being, of course, irrecoverably lost. Unfortunately the mischief does not stop here, for sympathetic irritation is not uncommonly set up in the other eye, requiring the removal of the injured organ. It will always be a matter for consideration, therefore, if it may not be as well to excise the globe as soon after the accident as possible; and I think that among the lower classes this step will generally be advisable, supposing, of course, that the eye has collapsed and been lost. Any attempt to preserve the stump of the eye, as a support for an artificial one, will be useless among the poor, for these people would find an ornament of this description more trouble than it was worth. Among the upper classes, on the contrary, where time is less important, and ornamentation a thing to be considered, we may allow of some delay before removing the remains of the injured eye;

Treatment.

Sutures in
rupture.

Excision
when ex-
pendient.

Among the
poor

and
wealthy.

and if no symptoms of sympathetic irritation arise in the other, the collapsed globe will form an admirable support on which to rest an artificial eye.

TUMOURS.

TUMOURS OF THE SCLEROTIC.—Morbid growths, whether cancerous or otherwise, rarely commence in the sclerotic, though doubtless this structure is frequently involved in tumours springing from the choroid within, or from the tissues contained in the orbit without. Mackenzie mentions several cases of sarcomatous tumours growing from the sclerotic; he says they most commonly occur amongst scrofulous subjects. The tumours are sometimes single, sometimes in clusters; they may be soft or hard, vascular or non-vascular. The tendency of these morbid growths is to disappear by progressive ulceration; but the morbid process is apt to result in perforation of the sclerotic, and the eye then becomes atrophied and destroyed.

Mackenzie says these fibro-plastic tumours present themselves most frequently on the temporal side of the eyeball, and at first are of a whitish colour. Their disposition is to spread and involve the parts around them as they ulcerate.*

Melanotic.

A few rare cases are on record in which melanosis has attacked the sclerotic, springing from its external surface, and not involving, at least for some time, the other structures contained within the orbit.†

* Mackenzie "On Diseases of the Eye," 4th edit. p. 703.

† Mr. Poland on Protrusion of the Eyeball: *Ophthalmic Hospital Reports*, vol. i. p. 171, where two such cases are referred to.

CHAPTER VII.

DISEASES OF THE CONJUNCTIVA.

Hyperæmic—Muco-purulent—Purulent—Diphtheritic—Granular—Pustular Conjunctivitis—Injuries of the conjunctiva—Hypertrophy and Atrophy—Pterygium—Relaxation—Serous and bloody effusions into the conjunctiva—Tumours of the conjunctiva—Diseases of the caruncle.

CONJUNCTIVITIS.

WE may now proceed to study the diseases of the conjunctiva, and as they will constitute the larger portion of the "eye cases" we shall meet with in practice, they demand a careful consideration. I propose describing the various forms of conjunctivitis (ophthalmia) under the following heads:—Hyperæmia, Muco-purulent, Purulent, Diphtheritic, Granular, and Pustular Conjunctivitis.*

It is difficult, in the first three of these affections, to draw a line of demarcation between the commencement of one form of disease and the termination of that preceding it; thus, muco-purulent conjunctivitis is always preceded by hyperæmia, and purulent conjunctivitis by both hyperæmia, and muco-purulent conjunctivitis; yet, practically, the distinction will be found both natural and useful. The symptoms of diphtheritic, granular, and pustular conjunctivitis are sufficiently well marked to distinguish them from one another,

* It seems to me hardly wise to retain the word *ophthalmia* to designate diseases of the conjunctiva; we employ the terms *iritis*, *choroiditis*, and so on, to signify inflammation of the iris and choroid; why not, therefore, conjunctivitis in analogous diseases of the conjunctiva?