REMARKS ON A CASE OF CYSTICERCUS IN THE VITREOUS BODY.

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DURING a lengthened stay in Berlin, I had the opportunity of observing the following case, which presents some points of interest.

G. R., a boy, ten years old, was brought into Professor Hirschberg's clinic on March 5th, for an amblyopia of the left eye. The mother said the eye had been struck with a snowball three months previously.

On examination, the right eye was found normal. In the left eye, the external parts were normal; he could only count fingers at two feet. The ophthalmoscope revealed peculiar opacities in the vitreous body, and two large infiltrations in the retina near the disc, which suggested to Professor Hirschberg the probability of a cysticercus in the retina not yet recognisable by the ophthalmoscope, being covered by the infiltration. After artificial mydriasis, a series of filmy opacities were visible, forming a polygon, distant from the retina about five millimètres (as observed by upright image). From this polygon other films proceeded towards the retina, the vitreous body being otherwise quite clear, as is the rule in recent cases of cysticercus. The disc, better seen in the inverted than upright image, appeared somewhat dim. There were two large retinal infiltrations in its neighbourhood, the lesser upwards and inwards, the greater immediately below. The most careful search could not detect a cysticercus either in the retina or in the vitreous body. There was no history of tænia in the patient or in his family.

The boy was attacked by a febrile angina after an error in diet, and discharged on the second day of the attack a long piece of tænia solium, which, of course, strengthened the suspicion.

March 29th. His general health was regained. Minute ophthalmoscopic search was made, and for the first time a cysticercus was detected free in the vitreous body. The films were present as before. The disc was clearer in consequence of the retinal irritation subsiding after the escape of the parasite. The lesser area in the retina was unchanged, whitish but partially red and excavated. Possibly this was the primary seat of the entozoon. The larger, which may have been the last lodging, was also whitish with partial vascularisation and excavated centre. The cysticercus appeared four times as broad as the disc (about six millimètres); it lay free in the outer and lower part of the vitreous body, not far distant from the retina; it was elliptical, with hydatid lustre at the edge. The head was within the cyst. Vision was better; he could see fingers at five feet. The cysticercus was growing rapidly from day to day.

An operation was performed on April 4th under chloroform. The outer canthus was divided to get more space. The conjunctiva bulbi was seized by forceps in the horizontal meridian, and the globe turned strongly upwards and inwards. In the equatorial region between the external and inferior recti, a flap of conjunctiva was turned over. Then a meridional section through the coats of the eye was made in the same region downwards and outwards, for about eight millimètres, by introducing Gräfe's cataract-knife deeply enough to cut through the vitreous layers between the coats and the cyst. The incision was not quite completed when the cyst appeared in the wound, and was easily removed without any loss of vitreous matter. The conjunctiva was replaced and closed by a stitch, the canthus likewise, and the usual bandage was applied. Healing took place without any irritation. The stitches were removed on the fifth and fourth days respectively. The conjunctiva was always white and the vitreous body clear during the healing process. The cyst when lying on the table was somewhat flattened, and measured eight by six millimètres.

Condition one Month after Operation.—The eyeball was free from irritation. He could count fingers at seven and a half feet. The filmy opacities in the vitreous body were markedly diminished in number and size. The fundus was clearly visible. There were a few small blood-spots in the retina and vitreous body. The patient was discharged, and after a short time the tænia was expelled by oil of male-fern in the usual way.

In the previous fourteen months, two other vitreous cysticerci were extracted by Professor Hirschberg, the results of which may be briefly noted. 1. A young woman could see fingers, before the operation, at two or three feet. One year after extraction, she read Snellen 3. There was moderate restriction of the field of vision

above, owing to preretinal new formations of connective tissue, but no trace of retinal detachment. 2. A young man had a large cysticercus. The patient declined operation for three or four months. Vision before the operation was very trifling. Extraction was difficult; slow shrinking of the globe followed, and enucleation was done a few weeks later.

REMARKS.—In etiological respects, the case detailed above is noteworthy, as one in which the probability of self-infection is very manifest. Only in a small proportion of the cysticercus cases on record was it possible to determine the coexistence of tænia. Thus, A. von Gräfe (*Arch. für Ophth.*, Band xii, part 2, 1866), in eighty cases, could only verify the presence of tænia in five. It is very likely, as suggested by Hirschberg (*Eulenburg's Real Encyclopædie*), that, were cysticercus patients carefully watched for a longer period than is usually permitted, the cases of self-infection would be found more numerous than some respected authorities are inclined to suppose (see Leuckart, *Die Parasiten*, Band i, p. 275).

As facilitating a diagnosis, much value attaches to the peculiar opacities in the vitreous body, which is otherwise quite clear. These were very characteristic in the above case, and created the first suspicion of the presence of an entozoon. Their importance is all the greater when it is remembered that they occur in subretinal as well as vitreous cases.

In the treatment employed, the feature of interest is the spontaneous escape of the cyst, obviating the introduction or repeated introduction of forceps and other extracting instruments. This advantageous occurrence was clearly due to the section passing deeply enough to divide the vitreous layers intervening between the cyst and the coats of the eye; and, further, to the incision being ample in size, and made at a point exactly corresponding to the seat of the cyst, as estimated by the ophthalmoscope.

Considering that the prognosis, in cases where the deeper parts of the eye are concerned, is very grave, since vision is gradually and certainly lost in every case, the necessity of early diagnosing the presence of the parasite is apparent. If left alone, it grows frequently, as in the above case, with great rapidity, until inflammatory changes of a severe character are produced—not to mention the damage done to the delicate structures of the fundus by the mere mechanical pressure of the cyst. Plastic iritis, or iridochoroiditis, followed by shrinking of the globe, is the commonest result; less often, a glaucomatous condition. Sympathetic ophthalmia, much feared by some, has never been verified as the outcome of the inflammation caused; though it may, of course, follow the operative measures used for the removal of the parasite. The early diagnosis and consequent operative interference may effect a considerable improvement in vision; and, even where no great improvement follows the removal of the cyst, an eye is saved which otherwise would come to enucleation, as an examination of the three cases I note will show. Mr. Teale's case, often quoted, as an exception to the rule that cysticerci always increase in size, is not considered by some Continental authorities as one of true cysticercus, but rather of a congenital formation in the vitreous body (Hirschberg, in Eulenburg's *Real Encyclopædie*).

There seems to be an agreement of opinion that extraction is the only treatment admissible in recent cases. Anthelmintics generally or locally, injecting fluids of various kinds into the eyeball, electricity, simple puncture of the cyst, etc., cannot be depended on, and usually do harm, without destroying the parasite.

The meridional incision appears to be the favourite method for extraction now-a-days. A. von Gräfe, in the earlier period of his practice used an equatorial incision for his advanced cases; later, he applied his peripheral linear incision, followed by iridectomy and extraction of lens, the cyst being then drawn out by a blunt hook. Good and permanent vision resulted only in a few cases. He never operated on a subretinal cyst. Arlt, of Vienna (1866) was the first to do this, and used a meridional incision, which has been variously modified by others since. A. Gräfe (of Halle), for instance, whose experience has been large, has operated many times with the best results by meridional incision, usually underneath an ocular muscle, which is first divided and reflected. In the foregoing case, the point selected was between two ocular muscles, which were in consequence untouched, thus excluding the possibility of subsequent strabismus.

The advantage of the meridional over the equatorial is, that the former much less often leads to shrinking of the globe; and, as it suits for subretinal as well as for vitreous cases, its superiority over the peripheral linear is obvious, apart from the smaller amount of disturbance of the vitreous body when the position of the meridional incision is well chosen.

Where great inflammation or shrinking exists, extraction is out of the question, for sympathetic ophthalmia is thereby favoured, without any compensatory improvement of vision. Enucleation only remains for such cases.

A few items of a statistical nature may be added. Cysticercus in the eyeball is rarer in England than on the Continent, and especially few are the cases from English sources where the deeper parts of the eye were concerned. On the other hand, where the anterior parts were the seat, the number is relatively large. In North Germany, in von Gräfe's time, the proportion was 1 per 1,000; but, in the last few years, a decline has been observed by Hirschberg, who met with only three cases in 8,000 new eye-patients during fourteen months—1882-83. This is probably the result of the compulsory examination of flesh-meats, both in respect of trichina and of cysticercus, which obtains in Germany. The occurrence of the parasite is much rarer in southern Germany, Austria, Italy, etc. In Vienna, for example, *Tænia mediocanellata* is the rule, *T. solium* the exception. As *Cysticercus mediocanellata* infests oxen, and cannot thrive in the human subject, it is never met with in the human eye. The only scolex found in the human eye is *C. cellulosa*, and hitherto only one entozoon has been found in a given eye, though Becker (*Mauthner's Ophthalm.*) says he has seen two in the same eye. The greatest size and age on record in the human eye are 15 millimètres and two years respectively.

The number of cases reported where an anatomical examination of the eye took place is about twenty, and of these, ten were sub-retinal, ten in the vitreous body. Von Gräfe thought that the original seat of the parasite was twice as often beneath the retina as in the vitreous body, the entozoon in a number of cases subsequently breaking through into the latter.

ON THE COMBINED USE OF THOMAS'S AND FURNEAUX JORDAN'S LAMINATED SPLINTS.

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IN the BRITISH MEDICAL JOURNAL (July 15th, 1882), the use of laminated plaster splints is recommended and very clearly described by Mr. Furneaux Jordan. He advises their use in Pott's disease of the spine, in hip-disease, fractured femur, contracted knee, etc.; and he points out the fact, which must be at once patent to every one, that their application requires only one movement of the patient—namely, that on to the surface of the splint; and does away entirely with the very great annoyance and source of non-success in cases of fracture of the neck of the femur, that of constant relifting of the patient as each successive turn of the bandage has to be carried around the back.

In this communication, I wish to deal entirely with cases of hip-disease and fracture of the neck of the femur. There are good reasons for bracketing these two classes of cases together. First, in both there exists a necessity for some method of dressing which will allow the patient quickly and safely to get up. In hip-disease, the patients are generally already marasmic, and fresh air and a modicum of exercise are of immense importance to them. In fracture of the femoral neck, the accident usually occurs in elderly people, who bear confinement badly. Secondly, in both there exists a necessity for absolute immobility at the hip-joint.

If these reasons be taken together, it will be seen that a method of treatment which will suit the one, cannot be far wrong if applied to the other. This being granted, two methods naturally occur to our minds as being most likely to fulfil the indications presented; and both, at first sight, and on reading the papers of their introducers, appear the thing required. I refer, of course, to Thomas's splint, and to some form of plaster apparatus, of which, without doubt, Jordan's laminated splint affords the best example.

I suppose that no method has ever perfectly fulfilled the hopes and predictions indulged in by their authors; no practice of any plan proposed is so entirely *coulour de rose* as the original theory; and I wish to indicate certain points in which both these methods are likely to disappoint those who trust to either entirely—points in which, when used conjointly, each supplies the other's defect; then, as in some combinations of drugs, powers reside which are sought for in vain when these are separate—I will show that this conjunction renders possible a control over the limb, and, through it, over the joint, which cannot be obtained when either is used singly.

From my own observation, I should say that most surgeons pay but little attention to the actual measurements given by Thomas as to the thickness of his splints; or surely the weight of them would have been objected to long since. Probably, in the majority of cases, the size and weight are left to the instrument-maker, who proceeds on common-sense principles. In other cases, especially in the country, the surgeon will choose his iron in the most convenient blacksmith's shop, and be guided by his own ideas as to the weight his patient can carry, having it afterwards covered and padded by the local saddler; but, if any one who has been doing this, with comfort and ease to his patient and satisfaction to himself, come, like myself, to have to dictate actual thicknesses and widths of iron to a professional instrument-maker, and take them direct from Mr. Thomas's work, he will be amazed to find that he will have a splint which is so heavy that, in the majority of cases, instead of thereby enabling his patient to get up, he has still more certainly condemned him to bed, as the only place in which its weight can be supported.

When we consider that a child with hip-disease is already weakened and emaciated by the pain it is suffering, or has suffered, that its muscles are more or less degenerated by the state of tonic contraction in which they are kept by the irritation of the branches of their own nerves supplied to the joint, as demonstrated by Hilton, it is perfectly evident that we have not much to fear from any sudden or powerful contraction of them; and that the minimum amount of weight, compatible with the requisite rigidity, will be most conducive to the second object of the splint, that of allowing the patient fresh air and exercise.

The amount of weight in a splint made for me, according to Thomas's directions, for a woman aged 26, was 4 lbs. 5 oz., and she could only bear it on when in bed, or, if standing, for a few minutes.

Rigidity, too, may be equally obtained by making the hinder rod still thinner, and supplementing its action by the side-rod recommended by Morris, in the last edition of Holmes's *Surgery*. He, however, merely carries the side-rod to the thigh clip; whilst, for a reason which will be presently evident, I prefer to carry it to the lower or leg clip.

But, apart from the weight, Thomas's splint has another drawback—its readiness to slip round; and the bad effects of this are far more evident when we have cases of fractured neck of the femur to deal with than in hip-disease. It does not fit closely to the body—closely, that is to say, in the sense of having any particular grip upon it. As I read Mr. Thomas, he seems to think that the way in which the upper or body clip is fixed or bent on the opposite side to the disease will suffice to prevent this. I can only say that I have never met an instrument-maker who could give it this knowing set or bend; and that, in one or two cases in which this was supposed to be done, the patient complained so forcibly of the impediment caused to the free action of his ribs, that the cunning bend had to be unbent, as the lesser of two evils, and the irritating tendency to swing round remained as before.

This, I take it, is practically the great drawback in the use of Thomas's splint; the weight can be regulated, but how is the tendency to slip round to be remedied?

Before answering this question, I should wish to examine the working of Jordan's laminated plaster. Will this take the place of the other? Are there no faults to find with this?

The laminated plaster, as I began by saying, has a great advantage over all other methods, except perhaps the Bavarian, of applying plaster-of-Paris, in that the position of the limb can be fixed once for all, and not interfered with again until the plaster has set. It is light, can be well padded, and, when dry, fits closely and firmly to pelvis and limb. Can anything further be required?

Well, practice does not bear out its perfect rigidity. It is extremely difficult to keep that part of it which is most important, the flexure of the hip, firm and uncracked; indeed, I may say I have never seen one that fully bore out its theoretical advantages. This, no doubt, may be due to several things: bad plaster, unskilful application, etc.; but, in ordinary practice, the fact remains that these splints frequently fail to give satisfaction from this sole fact, that they, as ordinarily applied, have not sufficient rigidity.

Still, they have a good grip of the body and the limb; they have no tendency to slip round, are light, and add no appreciable weight to the burden the patient has to carry.

Thomas's splint, then, has for *advantages*: perfect rigidity; no possibility of flexion or extension at the hip-joint; for *disadvantages*: weight, if made according to the original directions; want of actual grip; and tendency to rotation around an axis represented by a line drawn upwards through the main axis of the limb.