ON THE DIVISION OF ARTERIES BETWEEN TWO LIGATURES.

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IN THE BRITISH MEDICAL JOURNAL for April 7th I ventured to advocate the above method of ligaturing arteries as in my judgment the safest at present known. I am glad that my paper should have been the means of eliciting an expression of opinion on the subject from so high an authority as Mr. Holmes. (BRITISH MEDICAL JOURNAL, June 9th, 1883.) The operation with him, however, finds little favour. He views it as an antiquated procedure, and even regards those who practise it as showing a want of appreciation of the advance in the surgery of the arterial system. But Mr. Holmes' objections are, as he says, not that he considers it re-actionary, but that he believes it "inflicts unnecessary damage on the artery; that its efficacy as a safeguard against secondary hæmorrhage is very dubious; whilst it seems more likely to delay the healing of the wound and to expose the patient to greater risks of phlebitis and gangrene."

Now, with regard to the first objection, "that it involves a much freer dissection and exposure of the artery, separating it for the distance of half to three-quarters of an inch from its connections and from the accompanying vein," it is no doubt true that a trifle more of the sheath is separated than in the ordinary method; but if the operation be neatly done, nothing like three-quarters of an inch of the artery is exposed. In my paper, I put it at a little less than half an inch; three-eighths of an inch would perhaps have been more precise. And although more of the artery is exposed during the operation than during the ordinary method, there is this advantage, that, when the operation is finished, no portion of the artery above the upper or below the lower ligature is separated from its sheath, and hence has suffered from any disturbance of its arterial supply. (See paper of April 7th.) On the other hand, when an artery is tied in the ordinary way, a small portion of it on each side of the ligature has, as I expressed it, and as Mr. Holmes himself admits, its blood-supply more or less interfered with, and hence is liable to the same pathological changes as other tissues affected in a like way, viz., inflammation, ulceration, and necrosis. No doubt this interference with the vascular supply is, in the majority of instances, merely transitory; but I venture to differ from Mr. Holmes when he says that there is no reason at all for saying that it is ever the cause of secondary hæmorrhage. To my mind, nothing seems clearer than that a slightly extra interference with the blood-supply may be just sufficient to turn the balance and render what is usually but a transitory disturbance a serious element of danger. A case of what appears to me to be a well-marked instance of necrosis of a portion of vessel produced in this way was referred to in the paper of April 7th.¹

Two ligatures are used, it is true, instead of one, and both, as Mr. Holmes puts it, may bleed, which is tantamount to saying that the blood may come from the upper or the lower end of the artery; but so it may when one ligature is used. The fact, moreover, remains, that whereas, at St. Bartholomew's, bleeding from one or other end has not been so rare an event after the use of one ligature, bleeding from neither end has occurred in any of the cases where two have been applied.²

To say that, when both ends of an artery are tied, as in a wound, secondary hæmorrhage, except from the slipping of a ligature, never happens, would, no doubt, be a hazardous assertion, and one that I should hesitate to make. I do not know, however, of any case of secondary hæmorrhage which, under these circumstances, has occurred; meaning, by this, that I have taken some trouble to look up the point, and have failed to find an instance. As to the ligature slipping after the artery has been cut across, I do not see how this could well happen if it be tightly tied, as, by the division of the internal and middle coats, a shallow groove is formed in which the ligature lies.

In what way the operation should be "more likely to expose the

patient to greater risks of phlebitis and gangrene," I am at a loss to conceive; and I venture to think that any special risks of the kind are more imaginary than real. The division of the artery clearly does not constitute the special danger of gangrene, as the arrest of circulation is as complete when only one ligature is applied; and the vein, when the operation is neatly performed, is not even seen, much less exposed to injury. In one of the cases thus operated on at St. Bartholomew's Hospital, gangrene of the foot and leg did certainly occur; but there was no evidence whatever that the gangrene depended, in any way, on the method of tying the vessel. Indeed, its characters were rather those of arterial arrest than of obstruction to venous return. Again, the risk of phlebitis, I should have thought, would have been greater after the ordinary method; for, in avoiding the danger of making too large an opening in the sheath, the surgeon is liable, in passing the aneurysm-needle round the artery, to prick or transfix the vein, an accident that I have seen occur in this way on more than one occasion.

So much for what Mr. Holmes calls the drawbacks of the operation, which, however, I think I have shown to be not quite so obvious as his paper might lead us to infer. The chief advantages that I claim for the operation are that, by taking off tension, and consequently placing the artery in a state of rest, and by ensuring that no portion of it has its blood-supply interfered with, the risk of secondary hæmorrhage, if not entirely avoided, is reduced to a minimum, and the parts are placed in the best possible condition for healing. These advantages were discussed in the former paper, and need not be referred to again here. I was interested to find, however, from Sir Joseph Fayrer's letter³, that similar advantages are claimed for the operation by the Cavaliere Giuseppe Corradi, the clinical professor of surgery at Rome, who has long advocated and practised the operation in Italy. He has found it "more successful in every way than a single ligature, in that it diminishes tension and the probability of any unfavourable results, such as ulceration, hæmorrhage, or suppurative inflammation, whilst it favours the rapid healing of the wound." With regard to the efficacy of taking off tension of the elastic artery⁴, I was disappointed that Mr. Holmes did not discuss this point, but merely dismissed it as a theory which, for his own part, he questioned.

Ligature of the large vessels is a subject of so much importance to the surgeon; and the operation I am advocating is, to my mind, so superior, in many respects, to the one commonly performed, that I hope no apology is needed for again calling attention to the subject in my endeavour to meet the objections raised to it by Mr. Holmes. The surgeons of St. George's Hospital do not appear, from Mr. Holmes' article, to have had much, if any, experience of the operation; and I trust he will forgive me for saying that I cannot help regarding his objections as more theoretical than borne out by practical experience. I venture to think that, if our success in the use of the double ligature and division of the artery continues as great as it has hitherto been, we shall still show what Mr. Holmes pleasantly terms an ancestral proclivity for the operation at St. Bartholomew's, and shall be in no hurry, on merely theoretical grounds, to give up the successful method, complicated and antiquated though it be called, of our distinguished predecessor, Mr. Ramsden.

³ BRITISH MEDICAL JOURNAL, June 16th, 1883.

⁴ In reference to Mr. Callender's case, alluded to in my former paper, it is, unfortunately, not stated in the registrar's notes if the ligature had given way.

CORN-SILK, which a few years ago was proposed as a remedy for catarrh of the bladder and similar diseases, and which has been since successfully used, may, according to G. W. Kennedy (*Am. Jour. Pharm.*) be best presented for administration in the form of a fluid extract and syrup. The corn-silk, which should be green and fresh, must be cut into small pieces, mixed in a mortar, and beaten to a pulp with a menstruum composed of one part of glycerin and four of diluted alcohol. The mass is then transferred to a percolator, and finished in the ordinary way; diluted alcohol being used after ten per cent. of the weight of the drug of glycerin has been added. The weight of the extract should be equal to one half that of the fresh silk. The dose for an adult is from half to one drachm. A syrup, of which the dose is from one to two drachms, may be readily prepared by taking twelve parts of fluid extract and diluting with syrup to one hundred parts.

BRAWN AND BRAIN.—In view of what is frequently advanced regarding the mutual antagonism in the development of brawn and brain, it is worthy of note that four out of the five men who won prizes in the Boylston prize-speaking at Harvard College this spring had been prominent in athletics throughout their college course.

¹ See Mr. Bartleet's case, BRITISH MEDICAL JOURNAL, October 14th, 1882.

² The operation of double ligature and division of the artery has now been successfully performed at St. Bartholomew's five times by Mr. Thomas Smith, once by Mr. Morratt Baker, twice by Mr. Howard Marsh, and three times by myself. It has also been performed once at the West London Hospital by Mr. Edwards, one of the demonstrators of anatomy at St. Bartholomew's, also with success. I know of no case in which it has failed.