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UNDER WHAT CIRCUMSTANCES IS IT ADVISABLE TO REMOVE THE VERMIFORM APPENDIX WHEN THE ABDOMEN IS OPENED FOR OTHER REASONS?

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The importance of the vermiform appendix as a possible cause of complication in gynecologic pelvic surgery was suddenly and sharply brought to my attention some time since by the case of a patient who came under my care in December, 1894, suffering from general pelvic discomfort and painful menstruation. I made a median abdominal incision and found the uterus retroflexed, the ovaries adherent and the vaginal outlet relaxed. The uterus was suspended, the varicose ovarian veins ligated and the vaginal outlet repaired. The patient was little if at all improved by my treatment, to our mutual disappointment. After leaving my care she went to live in Pennsylvania, and some months later I had a letter from her, informing me that she had had an attack of appendicitis, for which she had been operated on by my old friend Dr. John Deaver. The result of the operation was a complete relief of all her previous symptoms, making it evident that the appendix had been the real cause of her pain and discomfort. I received this information with a sincere pleasure, not unmixed with some sense of mortification, but like other hard knocks this one taught me a valuable lesson.

Since the receipt of her reproachful letter I have never opened the abdomen without examining the appendix, whenever it was possible to do so without enlarging the incision or running the risk of conveying infection to clean structures. I have also ever since made a point of noting the condition of the appendix when examined, especially as regards its length and its freedom or adherence, including these data among others which the anesthetizer is expected to fill out on a printed slip. My statistics show that in a series of 115 cases in which the condition of the appendix was noted at the operation, it was found adherent to the right tube or ovary in 10 cases, in 37 cases it was involved in adhesions, it was congested in 3 cases and obliterated at the cecal end in one case. Only 64 appendices were perfectly normal. In a series of 200 abdominal sections I have had occasion to remove the appendix 25 times.¹

My interest in this subject has recently received a fresh stimulus from the fact that I am now preparing to publish a book on the appendix, and I have been under the necessity of closely considering the conditions re-

quiring its removal in my chapter on operative treatment. I find myself, under these circumstances, frequently brought face to face with the following question: Is it advisable to remove the apparently normal appendix whenever the abdomen is opened for other reasons; or, in other words, whenever there is an incision anywhere in the right lower quadrant of the abdomen?

In discussing this question with various friends I have found that considerable diversity of opinion existed among them in regard to it, and while some were decided in their belief that the radical plan of removal should always be adopted, others were equally emphatic in decrying such a procedure as meddling surgery. My experience in the matter led me to think that if the views of a number of prominent professional men on the subject were known it might lead to a general consensus of opinion in regard to it. I wrote, therefore, to 80 well-known surgeons in different parts of the United States, asking for their opinions and requesting permission to publish their replies. To these 80 inquiries I have received 74 answers. The method of interrogation employed was that of sending to each individual a return postal card containing two categorical questions in the following form:

Will you kindly write *yes* or *no*, after the two following queries:

1. When the abdomen is opened for other causes, and the perfectly normal appendix is easily accessible, is it your rule to remove it?
2. When the appendix is slightly adherent to neighboring structures, as peritoneum, ovarian or fibroid tumors, do you then remove it?

(Answer may be published.)

The replies to these questions make it evident that no uniformity of opinion exists as to the propriety of removing an entirely normal appendix. One surgeon of ability and experience, for instance, replies to the first question, "Yes, always," while another whose opinion is no less entitled to consideration, answers, "No; it is unsurgical." This wide divergence of opinion is only another evidence that our knowledge of the appendix must undergo further evolution before any unanimity exists among surgeons as to its surgical treatment. Contributions to the study of the subject likely to further this end are at present valuable, and, therefore, I think that the different points of view which have been revealed in the course of my inquiry call for a more detailed discussion than would be possible or suitable in the brief space which is all that can be devoted to the subject in the work for which the information was originally intended.

It is only fair that I should call attention at the outset to the fact that the categorical form of my inquiry did not allow the surgeons to whom it was ad-

1. "The Exploration of the Abdomen as an Adjunct to Every Celiotomy," *Med. News*, Dec. 16, 1899.

dressed any opportunity to qualify their opinions, which some of them may have wished to do. Notwithstanding the conditions imposed, however, various restrictive clauses appear in their replies. Such qualified answers as "No; but I do sometimes," or "Yes, usually" have been treated as unqualified, since it is the rule which is expressly asked for and special cases are not the object of consideration. Qualifications such as "if the patient's condition permits" have also been set aside, because it is assumed that any serious contraindication nullifies the question. Some few qualified answers remain which can not be classified unreservedly as either affirmative or negative, and these are separately considered.

REMOVAL OF NORMAL APPENDIX.

The following is a tabulation of the answers received to the first question: "When the abdomen is opened for other causes and the perfectly normal appendix is easily accessible, is it your rule to remove it?"

SURGEONS ANSWERING "YES."

BAKER, W. H.	LYDSTON, G. F.
BOLDT, H. J.	MANN, M. D.
BOVEE, J. W.	MACDONALD, W. G.
CARTLEDGE, A. M.	MACMONAGLE, B.
CLEVELAND, C.	MCBURNIE, C.
DICKINSON, R. L.	MCCOSH, A. J.
DUDLEY, A. P.	MCRAE, F. W.
EDEBOHLS, G. M.	MEYER, W.
FRY, H. D.	PECK, G. S.
HARVIE, J. B.	RICHARDSON, M.
HENROTIN, F.	SCHACHNER, A.
HOUSTON, D. H.	VAN LENNEP, W. B.
JOHNSTON, G. B.	VINEBERG, H. M.
Total, 26.	

SURGEONS ANSWERING "NO."

ABBE, R.	GOFFE, J. R.
ALLEN, D. P.	JOHNSON, J. T.
BAGOT, W. S.	LAPLACE, E.
BECK, C.	MARCY, H. O.
BERNAYS, A. C.	MARTIN, E.
BOISE, E.	MCBURNEY, L. S.
BONIFIELD, C. J.	MONTGOMERY, E. F.
BURRAGE, W. L.	MURPHY, J. B.
CABOT, A. T.	NEWMAN, H. P.
CARMALT, W. H.	NOBLE, C. P.
CARPENTER, J. S.	NOBLE, G. H.
CHADWICK, J. R.	NORRIS, R. C.
CORDIER, A. H.	PALMER, C. D.
CURRIER, A. F.	PARK, R.
CUSHING, E. W.	PILCHER, L. S.
DAVENPORT, F. H.	PRICE, J.
DEAVER, J. B.	PRYOR, W. R.
DOUGLAS, R.	REYNOLDS, E.
DUDLEY, E. C.	RODMAN, W. E.
EDGAR, J. C.	SENN, N.
FINNEY, J. M. T.	VAN HOOK, W.
GOELET, R. H.	VANDER VEER, A.
Total, 44.	

The following are the qualified answers received:

J. G. CLARK.—I usually say to the patient that if I were in a similar position, I should have it removed. At least 50 per cent. request it under these circumstances.

H. C. COE.—No, not yet; but I am becoming converted to the practice.

A. F. JONAS.—Not always.

B. H. WELLS.—Yes, with the patient's consent, and when it does not increase risk.

REMOVAL OF THE SLIGHTLY ADHERENT APPENDIX.

Following are the answers to the second question: "When the appendix is slightly adherent to neighboring structures, peritoneum, ovarian or fibroid tumors, do you then remove it?"

SURGEONS ANSWERING "YES."

ABBE, R.	DAVENPORT, F. H.
ALLEN, D. P.	DEAVER, J. B.
BAKER, W. H.	DICKINSON, R. L.
BERNAYS, A. C.	DUDLEY, A. P.
BOLDT, W. J.	EDEBOHLS, G. M.
BOVEE, J. W.	EDGAR, J. C.
BONIFIELD, C. J.	FINNEY, J. M. T.
CABOT, A. T.	FRY, H. D.
CARPENTER, J. S.	GOELET, R. H.
CARTLEDGE, A. M.	GOFFE, J. R.
CHADWICK, J. R.	HARVIE, J. B.
CLARK, J. G.	HENROTIN, F.
CLEVELAND, C.	HOUSTON, D. H.
COE, W. C.	JOHNSTON, G. B.
CORDIER, A. H.	JONAS, A. F.
CUSHING, E. W.	LAPLACE, E.

LYDSTON, G. F.
MANN, M. D.
MARCY, H. O.
MARTIN, E.
MACDONALD, W. G.
MACMONAGLE, B.
MCBURNIE, C.
MCCOSH, A. J.
MCBURNEY, L. S.
MCRAE, F. W.
MEYER, W.
MURPHY, J. B.
NEWMAN, H. P.
NOBLE, C. P.
Total, 60.

PALMER, C. D.
PARK, R.
PECK, G. S.
PILCHER, L. S.
PRICE, J.
REYNOLDS, E.
RICHARDSON, M.
RODMAN, W. L.
SCHACHNER, A.
SENN, N.
VAN LENNEP, W. B.
VANDER VEER, A.
VINEBERG, H. N.
WELLS, A. M.

SURGEONS ANSWERING "NO."

BAGOT, W. S.
BOISE, E.
BURRAGE, W. L.
CARMALT, W. H.
Total, 7.

CURRIER, R. F.
NOBLE, G. H.
PRYOR, W. K.

The following qualified answers to this question were received:

C. BECK.—Preferably, yes; but not unconditionally.

R. DOUGLAS.—Yes, if adherent to normal structures; no, if only slightly adherent to neoplasms.

E. C. DUDLEY.—So many considerations pertain here, that the question should not be answered yes or no.

J. T. JOHNSON.—I do, if it is diseased, or injured by the separation of adhesions.

E. E. MONTGOMERY.—Not unless conditions are such as to lead me to fear that it will be involved in subsequent adhesions.

R. C. NORRIS.—Not always.

W. VAN HOOK.—I would remove the appendix:

1. When its removal would facilitate the remainder of the operation.
2. When the integrity of its blood supply is interfered with.
3. When the appendix itself is diseased.

We have here 44 unqualified negatives to the first question against 26 affirmatives; and 60 unrestricted affirmatives to the second question against 7 negatives. Therefore, these results show a large majority against the removal of the normal appendix simply because the opportunity arises to do so; and an overwhelming majority in favor of the removal of the appendix when it deviates in the slightest degree from normal.

My own opinion coincides in both cases with that of the majority. I never remove the appendix in the course of an operation for other causes when it proves entirely normal on examination, but I always remove it if it is even slightly adherent to other organs. I also remove it invariably when it is free if its length exceeds normal. My reasons for not removing the normal appendix are as follows:

1. Its removal involves a slight additional risk, owing to the fact that no matter how good the patient's condition may be at the time the appendix is removed, there is no guarantee that it will remain so until the end of the operation, and should a condition of shock ensue the additional five minutes consumed in the removal of the appendix will lessen the chances of recovery.

2. We are not yet in a position to estimate the importance of removing the normal appendix as a prophylactic measure, for statistics have not yet shown that there is a definite *per mille* risk, either of death or of serious disease, in retaining the organ.

3. The fact that the appendix has no known function does not prove that it is a functionless organ, although we are in the habit of calling it so; and it is possible that an improved knowledge concerning it may in the future demonstrate some reason for its preservation. It is only a few years since the ovaries were supposed to have no use or purpose except that of reproduction, and their extirpation, apart from the interference with their primary function, was a matter of no importance. Now, however, when their relation to the process of internal secretion is beginning to be under-

stood, we find ourselves responsible for their preservation from entirely different reasons.

The arguments of those who believe in removing the normal appendix whenever possible are so well stated by Dr. Maurice Richardson in a letter accompanying his formal reply to my questions that I can not do better than quote his words:

The questions on your postal card with reference to appendectomy require, in my opinion, more than "yes" and "no" answers. The first question, to which I replied "yes," was, in substance, whether, in the course of abdominal operations, I remove the normal appendix. I should not take the five minutes necessary for this operation if the patient's condition were not excellent. I should not remove the appendix in hopeless disease of other viscera. I should not make a second incision to remove it, were it not entirely accessible through the first. I do not think that removal of the accessible normal appendix—or, for that matter, the abnormal non-adherent appendix, with healthy base and healthy cecum—I do not think, I say, that removal of such an appendix adds materially to the shock. I have removed consecutively five hundred appendices, more or less diseased, from patients in good general condition without mortality. Some of the operations have been exceedingly severe, and very extensive, but all the patients have recovered. Some cases have required resection and suture of the cecum; some dissections a foot long; but the results have been invariably favorable. Acute appendicitis in its fulminating form is such a dreadful disease—having always from its very nature a fearful mortality, no matter who operates, or how, that I am unequivocally in favor not only of seeking the appendix in every suspected case, but of removing the normal appendix whenever it is exposed.

Dr. Richardson's views in regard to the second point at issue, the removal of the slightly adherent appendix, agree entirely with my own, and I again make use of them as a clear and forcible expression of the reasons for the course approved by the large majority of surgeons:

With reference to the second question, I would say that when there is the slightest evidence of the abnormal I deem it my duty to remove the appendix, even if the risk of the original operation is somewhat increased; provided, always, that the patient has no bar to operation in general condition, in age, in hopeless lesions of other viscera, in lesions of other viscera which may temporarily contraindicate operation, or in lesions of other viscera which will in a few years fatally compromise life. If, for any other reason, the patient has a short expectancy of life I do not remove the appendix in these cases. Any of these reasons would, of course, contraindicate the removal of a healthy appendix.

There remain two points relating to the subject under discussion which ought not to pass unnoticed.

Dr. Robert Abbe is of the opinion that the perfectly normal appendix never contains fecal concretions. They are frequently present, however, in appendices which are entirely normal in appearance, and I have found them myself in such appendices in a number of instances. Therefore, any appendix in which concretions can be felt should be removed, even though it is to all appearance entirely healthy.

The question is occasionally raised whether the appendix ought not always to be removed when operations are performed in the neighborhood of the cecum which might give rise to post-operative adhesions. In the case of men such risk is inconsiderable, but with women there is a possibility that the appendix may become adherent to the fresh wound in operations on the uterus or the right ovary. Five cases of this kind, two of which were my own patients, have come under my observation. They are cited in the section on operation in my forthcoming book. It is sufficient to say here that in

one of my cases the appendix became adherent to the stump of the right ovary, and was subsequently removed by the late Dr. Hunter McGuire; and in the other, where the appendix was adherent to the wound in the uterus, caused by a myomectomy, it was removed by Dr. Finney. The other three cases were all consequent on the removal of the right ovary, and the operation for the removal of the appendix was done by Dr. McGuire in one case and by myself in the other two. Two of these five cases have been reported by Dr. McGuire,² who makes, in connection with them, a suggestion of much practical importance, namely, that whenever the right ovary is removed the raw stump should be protected by covering it with peritoneum and burying it out of sight. There is no doubt that an appendix which hangs free from the end of the cecum and is long enough to reach the field of an adjacent operation is liable to become adherent and thus become the source of an attack of appendicitis. I therefore adopt the rule of removing long free appendices in all right-sided pelvic operations, but I would not remove a short appendix which is normal, nor one which is tucked up on either side of the cecum.

CONCLUSIONS.

In conclusion the following points should be emphasized:

1. The appendix should always be examined and its condition noted whenever the abdominal cavity is opened for any reason, provided no additional risk is involved.

2. The opinion of the majority of surgeons in this country is against the removal of a perfectly healthy appendix, 44 to 26 being the proportion shown in my investigation.

3. The opinion of the large majority of surgeons is in favor of removing an appendix which is even slightly adherent to other structures, 60 to 7 being the proportion shown in my investigation.

4. The fact that the appendix is normal in appearance does not prove that it contains no fecal concretions, for I have found them in a number of instances. Their presence is sufficient reason for the removal of an apparently healthy appendix.

5. After removal of the right ovary the stump should always be covered with peritoneum in order to prevent the risk of adhesion to the appendix. A long and free appendix should invariably be removed.

DRAINAGE OF EXTRAVESICAL AND EXTRA-PERITONEAL SUPPURATIONS OF THE MALE PELVIS.*

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ANATOMIC RELATIONS.

The anatomic part to be considered represents the space, or perhaps better, the line of union, bounded externally by the deep pelvic fascia which covers the inner contour of the pelvic cavity and internally by the peritoneum and by the fibrous sheath which envelops in common the bladder, the male sexual apparatus and the upper rectum. This sheath is really formed of deflections from the deep pelvic fascia which project upward from the points where the pelvic viscera make their exits from the pelvic cavity. It is evident, therefore, that the lower limits of this space are sharply defined, while

2. Trans. Med. Soc. Va., 1895.

* Read at the Fifty-third Annual Meeting of the American Medical Association, in the Section on Surgery and Anatomy, and approved for publication by the Executive Committee: Drs. H. O. Walker, A. J. Ochsner and DeForest Willard.