nature that its incorporation in a national public health organization will lead at once to the concentration on that agency, its personnel and its work, of the interested attention of powerful commercial and political interests. No matter how great the economic advantages resulting from public health work, nor to what extent it is clothed for constitutional reasons in the garb of commercial justification, the fact remains that its real objects are altruistic and humanitarian, and with these the politics of personal interest will not mix, though they may discolor them.

In conclusion I deem it proper to state that this article is in no sense inspired by Surgeon-General Wyman or to be construed as an expression of his opinions. It has not been submitted to him, nor has he been informed of its contents. It owes its publication simply to a personal desire to provide a basis for a discussion of a question that is of vital interest to the public and fundamental to the health and lives of the people of the United States.

EXTRACAPSULAR FIXATION OF THE MOVABLE KIDNEY *

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The word "extracapsular" is used in the title of this paper to imply fixation of the kidney by a method entirely external to the tunica fibrosa as distinguished from any method that implies either invasion of that tunic or surgical injury to the kidney itself.

The further significance of the term as it is here used may be made clear by a brief description of the essential features of the operative procedure that I have employed for the last several years—indeed, since 1904—for the anchorage of the pathologically movable kidney,¹ as follows:

TECHNIQUE OF EXTRACAPSULAR NEPHROPEXY

1. The patient is placed in the classical position on the well side with a firm pad, preferably pneumatic, under the same side. The equally classic incision about 1 cm. below the costal margin and about 10 cm. in extent is made obliquely downward and forward. This dissection is carried through the wall by cutting with the exception that, to the extent that may be found practicable in each individual case, the obliquus externus, the obliquus internus and the transversus abdominis muscles are separated and drawn apart by the finger rather than divided by the knife. In this way the capsula adiposa of the kidney is reached.

2. The capsula adiposa is a most important structure in my procedure, and the very first point that I wish to emphasize is that extreme care must be taken to separate it from its relations to the abdominal wall, to the extent that such relations may have survived the displacement. Care must be taken not to separate the capsula adiposa from the tunica fibrosa.

3. The kidney with its capsula adiposa attached to it is then lifted to the surface. In carrying out this manipulation it may be and generally is necessary first to deliver the upper pole of the organ through the operation wound, for reasons that I shall later explain.

4. The next step in the operation consists in wiping away the globular fat, much or little, from the con-

nective tissue stroma of the capsula adiposa. This stroma, likewise important in this procedure, will be found arranged in very distinct and essentially parallel striae extending obliquely downward and forward from the lower pole of the kidney. The manipulation of wiping the fat from its meshes is best carried out by the use of gauze, care being taken not to separate these striae from their attachment to the tunica fibrosa.

5. Gauze is now likewise employed to apply vigorous friction to the tunica fibrosa in its upper zone where the capsula adiposa but rarely invests it; but if it does the fat should be wiped away if possible without disturbing the attachments of its basic connective tissue striae. This friction to the tunica fibrosa should be continued until the upper zone shows small punctate hemorrhages over its entire area.

6. The kidney is now left for a few moments while any remnant of the capsula adiposa that may have been left adherent to the abdominal wall is entirely wiped away with gauze.

7. A nest—*nidus renalis*—free from fat—having thus been secured, the kidney is slipped back as nearly *in situ naturali* as it will go without force.

8. The connective tissue striae of the capsula adiposa are then divided transversely at a distance of from 1 cm. to 2 cm. from the lower pole of the kidney. The stump thus formed on the renal side is stitched by chromicized catgut to the inner surface of the upper margin of the operation wound while the lower stump is similarly attached to the inner surface of the lower margin of the operation wound.

9. The operation wound itself is then entirely closed by laminated sutures. Drainage, being unnecessary, is, of course, not employed.

In explanation of the various steps that I have described, more particularly those that are peculiar to this procedure, I beg to offer a few observations:

THE CAPSULA ADIPOSA AND ITS CONNECTIVE TISSUE STRIAE

The connective tissue striae of the capsula adiposa, so essential to this procedure, require a few words of explanation, particularly as they, in an aggregate sense, and as an anatomic structure have so far very generally escaped recognition as being of practical importance. In my previous published remarks² on this structure—I have come to recognize these striae as an anatomic element—I stated that when I first noticed it I thought it was adventitious, and probably, of inflammatory origin and that I had used it because it was convenient and seemed to lend itself to unipolar fixation.

It now seems, from a recent somewhat exhaustive research of the literature, that my experience was not singular. Thus Hahn,³ whose observation extends back to his inauguration of the practice of kidney fixation in 1881, says that "fibers run from the tunica fibrosa in front and behind to the subperitoneal fascia." Newman, of Glasgow observes⁴ that "frequently in long-standing cases the fat becomes infiltrated with connective tissue, making it tough and fibrous and when this altered capsule is stitched to the parietes the kidney can be maintained in its position without suturing the organ itself." Carwardine, of Bristol, says:⁵ "It is common in cases of wandering kidney to meet with strong fibrous bands, some of which require scissors or scalpel for their divi-

2. Tr. Am. Assn. Obst. and Gynec., 1905-1906.

3. Deutsch. Ztschr. f. Chir., 1902, lxxvii, 354.

4. Glasgow Med. Jour., 1904, Series 4, lxi, 345 and 418.

5. Bristol Med.-Chir. Jour., 1905, xxiii, 24.

* Read in the Section on Surgery of the American Medical Association, at the Sixty-first Annual Session, at St. Louis, June, 1910.

1. Tr. Am. Assn. Obst. and Gynec., 1906, xix, 19.

sion." Longyear, of Detroit, was the first to describe⁶ these striae as comprising a distinct and significant structure. His subsequent study prompted him to the conclusion that "this framework of the fatty capsule is probably the tissue left in the track of the ovary or testicle in its descent from the Wolffian body high up near the kidney."⁷ As the structure thus became recognized as of definite embryonal origin, he called it a "ligament" and as it extended from the lower extremity of the tunica fibrosa of the kidney to the cecum on the right and to the sigmoid on the left he called it the "nephrocolic ligament." In recognition of this valuable contribution others have called it "Longyear's ligament." But whether the structure may with propriety be called a "ligament," in view of the restrictive meaning of that word, may well be open to doubt. At any rate the structures may be designated as nephro-inguinal striae. In my own practice in forty-two carefully observed cases, they have been uniformly present. In certain cases, not necessarily of fat persons, the fat of this tunic is very abundant while in other cases, not necessarily of thin persons, it is almost absent. In every case, however, the tunic was represented by the striae. I am persuaded that in cases in which they have seemed to be absent in the hands of other operators they have either not been looked for or have been torn from the tunica fibrosa in the process of enlèvement of the kidney.

REMOVAL OF FAT FROM THE RENAL FOSSA

The next step peculiar to this procedure that seems to call for a word of explanation is that of carefully wiping away any mural fat that may be found in the renal fossa. The surface of this fossa is of course the natural bed of the capsula adiposa and the area of its normal implantation. Its attachment to this surface is, however, so much less intimate and so much less firm than that to the tunica fibrosa that it is liable to be entirely broken up by the traction of the displaced organ.

In some instances, however, the fatty capsule seems to separate into two layers, one going with the kidney, the other remaining adherent to the inner surface of the renal fossa. An attempt to make a kidney adhere to a surface thus covered with fat, no matter how the kidney may have been prepared, must obviously either fail from the start or be of short duration. This fact is, in my opinion, and in view of the uniform permanency of results in my cases, an important element in the explanation of the relatively large proportion of failures reported by many operators. Indeed but few operators in recording their technic, insist, as does George Erety Shoemaker,⁸ for instance, on the importance of clearing the fat away from the internal surface of the abdominal wall.

DIVISION OF THE NEPHRO-INGUINAL STRIÆ

The striae of the capsula adiposa are divided and the upper segment is attached above the incision and the lower below it for reasons made plain by Longyear's research, confirmed by my own experience. Thus Longyear has demonstrated that these striae are in such intimate connection with the cecum on the right and the sigmoid on the left that they may and probably do become the media of traction by the loaded or replaced bowel on the kidneys. He is convinced that this is such

an actual condition that it is to be considered a positive etiologic factor in descent of the kidney.

It is therefore of importance to sever the continuity of these media, as Longyear does not do, and thus to intercept the transmission of this force, which might otherwise become effective in displacing the kidney. But while the kidney is being thus protected from traction, care must be taken not to deprive either the cecum or the sigmoid of any suspensory power that may inhere in this anatomic arrangement. It is important, therefore, that the lower segment of these striae shall be attached to the lower margin of the operation wound.

FRICTION OF THE TUNICA FIBROSA

Vigorous friction of the tunica fibrosa above the zone covered by the adherent striae of the capsula adiposa, especially on the posterior surface of the kidney, and carried to the point of inducing punctate hemorrhages, is practiced for the purpose of provoking an abundant exudate—the glue for the postage stamp—by which when organized the organ through its tunica fibrosa becomes adherent to the abdominal wall.

Some operators endeavor to accentuate this process by treating the tunica fibrosa with some irritant. Thus Carwardine⁹ treats the whole surface with strong phenol while others use a mild solution of silver nitrate for the same purpose. In the light of my experience with gauze friction these expedients are unnecessary. While their reported immediate results would seem to indicate that they may complicate rather than simplify the operation.

WHY FIXATION SHOULD BE EXTRACAPSULAR

This whole procedure as now evolved is designedly extracapsular, because its object is to restore the kidney as nearly as possible to its original relations and normal attachments. The normal attachments of the kidney are external to its capsular investments. This anatomic fact, generally recognized, is emphasized by Collins Warren of Boston, quoted by G. H. Mallett¹⁰ that "by far the most important tissues concerned in maintaining the kidney in its normal position are the attachments between the posterior and upper aspect of the tunica fibrosa and the fascia covering the lumbar muscles and the peritoneum covering the diaphragm." H. Critchley Hinder,¹¹ of Melbourne, writing from a large experience, recognizes the rôle of the capsula adiposa, as he says, in holding the kidney in its normal position. This, I believe, is one of the fallacies of our latter-day teaching. It seems to me far more rational to believe that the capsula adiposa is a sort of "shock-absorber," if I may borrow an automobile phrase, and that when the kidney retains its position it is in spite of the looseness and instability of this structure. But even this conception of its function invests it with enough importance to entitle it to consideration, and I consequently agree with Hinder that in the pathologically movable kidney, "the fatty padding which encases the kidney is very loose and does not at all hold the organ in its grasp." It is important furthermore to remember that the intracapsular mobility of the kidney is essential to the normal exercise of its function and that that mobility is destroyed by reimplantation of the kidney following decapsulation.

It is likewise of importance to bear in mind that the mero-parenchymal implantation of the kidney following

6. Tr. Am. Assn. Obst. and Gynec., 1905, xviii, 1.

7. Detroit Med. Jour., 1906, vi, 1.

8. The Modification of the Technic of Fixation of the Movable Kidney, THE JOURNAL A. M. A., Dec. 8, 1906, p. 1917.

9. Bristol Med.-Chir. Jour., 1905, xxiii, 24.

10. Am. Med., 1902, iii, 513.

11. Intercolonial Med. Jour., Australia, 1903, viii, 499.

decapsulation not only interferes with the physiologic vascillation in the volume of the organ incident to its vascillating functional requirements, but subjects it to the damaging influence of vibrations incident to walking and riding and to shocks incident to more violent exercise of the body. In this way, as well as by the use of transfixion sutures, pathologic changes are induced in the organ.

Dr. Row, of Huntington, W. Va., brought me a case a year or so ago in which twenty months after operation by decapsulation and transfixion at the hands of another surgeon, I operated for relief of pain. I found that the kidney had been converted into three lobes by the transfixion sutures, and that it had a firm inelastic cicatricial envelope as the result of the decapsulation.

T. Carwardine,¹² reports a similar case in which the kidney was indistinguishably blended with the surrounding parts, but in which the kidney substance was paler and firmer than usual, and scarcely bled when cut as if a certain fibrosis had developed from the capsule along the trabeculae.

Another case in point was brought to me a couple of years ago by Dr. Heflin of Newport, Ky., for fixation of the left kidney. The right one had been anchored several years before by one of the most distinguished operators in the United States, who employed the decapsulation-transfixion method, with the result that the kidney had been a constant source of pain from the date of operation. I anchored the left kidney by the method that I have just described with the result that it has been absolutely painless from the date of convalescence. When the patient was last seen, less than a month ago, both kidneys were firmly anchored, but the right one—the decapsulated and transfixed one—remained painful. The contrasting results of the two procedures were never more strikingly illustrated.¹³

Paul F. Freiderich of Greifswald¹⁴ asserts that transfixion sutures always cut through, sometimes completely, and interfere with function.

CONCLUSIONS

In conclusion permit me to add that I have been induced to evolve and practice extracapsular fixation of the kidney, because (1) it is surgically feasible, (2) it is effective primarily, (3) it is generally, and indeed, as far as my experience goes always practicable, and (4) it comes nearer than any other procedure to restoring the pathologically movable kidney to its normal anatomic relations and to the exercise of its normal physiologic functions. I urge it as the operation of choice as against certain other procedures that are yet prevalent because, among the latter, (5) decapsulation is liable to induce and frequently does induce wholly unnecessary pathologic changes resulting either in its loss or in the invalidism of either the kidney or the patient or both; (6) transfixion sutures in the parenchyma may and often do induce similarly disastrous consequences; (7) treatment of the surface of the kidney by irritating substances induce adhesions and tissue changes that are pathologic in character; and (8) in consequence of the greater liability to hemorrhage and

infection following all invasions of the true capsule and the parenchyma of the kidney and for other obvious reasons these procedures are more liable than extracapsular fixation to be followed by primary complications and final failure.

60 The Groton.

ABSTRACT OF DISCUSSION

DR. SAMUEL LLOYD, New York City: My criticism of Dr. Reed's operation would be that he fails to recognize the fact that a very large number of the patients with movable kidney have chronic nephritis. Dr. Edebohls called attention to this fact some years ago, and it was his observation in these cases that led him to perform decapsulation of the kidney for chronic nephritis. Often we do not discover that these patients are anicted with nephritis until we are operating on them. Dr. Reed, by using the fibrous bands in the fatty capsules for his fixation and leaving the capsula propria intact, would deprive the patients of the very best feature of their operative treatment, the cure of the nephritis by the decapsulation. It has been my experience in following up Dr. Edebohls' operation, that a great deal of benefit is derived from the decapsulation of the kidney and its fixation through the capsule, not through the kidney. I have not seen the difficulties Dr. Reed speaks of following exercise, such as pain or discomfort. The transfixion was given up by Dr. Edebohls many years ago, because fixation by means of the capsule gave better results.

DR. CHARLES A. L. REED, Cincinnati: I recognize the fact that pathologic conditions in an individual case may necessitate division of the capsule.

FURTHER REPORT ON ILEOCOLITIS COMPLICATED BY ACIDOSIS*

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Three years ago I presented to this Section a series of cases that had occurred under my observation during the preceding four years, and I now wish again to call attention to them by the relation of a few histories and by a brief discussion of the problems involved.

I have been unable to find descriptions in the textbooks of the symptom-complex presented by the series, and my object now, as three years ago, is to focus attention on and bring recognition of this distinctly marked symptom-complex. It is not reasonable to suppose that such cases are confined to one limited area. It is only reasonable to conclude that they have not been recognized elsewhere.

Thirteen cases have come under my observation since the report of three years ago, mostly in consultation, but this does not embrace a number of other cases that have come to my notice, directly and indirectly, in the practice of other physicians of our district. A large percentage of the whole series of thirty-two cases has occurred in breast-fed, well-nourished children, previously healthy and flourishing. The oldest of the series was 2½ years of age.

SYMPTOMS

Loose bowels, caused by a mild grade of ileocolitis and lasting from one to four days, precede the onset of the typical symptoms. Then labored breathing develops, often suddenly, followed by prostration, restlessness, obstipation, enlargement of the liver. The temperature

12. Bristol Med.-Chir. Jour., 1905, xxxii, 24.

13. Since this paper was read this patient has returned to the German Deaconess Hospital entirely incapacitated by pain in the right kidney. She has improved somewhat under rest, but insists that if the pain returns with the same severity as formerly the kidney must be removed if necessary for her relief.

14. Arch. f. Gynik., lxxii, 368.

* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-first Annual Session, held at St. Louis, June, 1910.