No.	Name and Age.	Prominent Symptoms.	Date of Operation.	Result.
28	M. M., 25, female, unmarried	Five months' pain, sometimes severe; right kidney; left, see Case XXIV	January, 1894	Benefited; some pain at present.
29	J. C., 23, male	Duration 6 years; frequent attacks of pain lasting 2 or 3 days; vomiting; smoky urine	July, 1894	Improved.
30	A. K., 54, female, married	Pain came on suddenly 3 years ago; frequent attacks since	January, 1895	Well at present time.

OBSERVATIONS ON THE EFFECTS OF DOUBLE CASTRATION (WHITE'S OPERATION) UPON THE ENLARGED PROSTATE.

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I BELIEVE that the operation of double castration, which Dr. J. W. White, of Philadelphia, has proposed for the shrinkage of the enlarged senile prostate, is a valuable and an important addition to our methods of treating the distressing sequelæ of this form of urinary obstruction, for, although my experience is limited to nine cases, yet I have seen sufficient improvement in these to induce me to recommend the operation for certain forms of the disease. I gather that the profession at large is too sanguine as to the immediate benefit to be expected from the procedure, that too pronounced a relief is anticipated from it, and that it is regarded as a panacea for all stages of prostatic obstruction. These views, I submit, are untenable. It is rather to introduce a discord in the prevailing harmony of the results which have already been published that I offer the following conclusions for consideration and criticism.

I would venture to suggest that those who record their experiences should be careful to recognise and to mention the character and size of the prostate *per rectum* and the length of its channel before and after operation, for it is only upon accumulated reports of such data that we can be guided to the selection of that form of prostatic enlargement which is best suited for double castration. Accurate estimation of the character and size of the prostate is far from easy. I cannot but believe that statements describing enormous prostates disappearing in three weeks after orchectomy spring from an erroneous appreciation of the size and shape of the gland.

I may claim for myself to have avoided false impressions as far as is possible, by having educated my fingers to detect slight differences in the rectal contour and consistency of the prostate under the varying conditions of health and disease. For the last ten years I have been in the habit of modelling in clay¹ or drawing in diagram nearly every prostate I have examined, but my notes on those bearing on this subject must be, for brevity's sake, excluded from this article.

My cases of double castration are briefly as follows:

CASE I.—This was my test case for shrinkage of the normal human prostate after orchectomy. I ablated the entire genitals of a man, aged 45, by the Thiersch-Gould method, for extensive epithelioma of the penis. After six months I found the prostate had been reduced to the size of a small bean.

CASE II.—Aged 76. Some years of feeble prostatic micturition. Sudden and prolonged retention. Extreme difficulty of catheterisation. Prostate unusually hard and enlarged, especially in the left lobe. Suprapubic drainage, because patient was at a distance from medical attendant. Double orchectomy. Result: in one week patient began to evacuate a little urine voluntarily, the suprapubic wound closed, and in three weeks he was able to do without a catheter. The prostate had slightly diminished in size by this time, and, though further diminished in three months, it was still appreciable. His last report was: "I have had no stoppage; the stream varies; sometimes it is feeble, at other times there is high pressure. The intervals between making water also vary; sometimes I may go five or six hours without a call, at other times I have to urinate every two or three hours." Improvement maintained.

CASE III.—Aged 70. Symptoms of enlarged prostate for six years. Attacks

of retention. Slight cysto-prostatitis with some mild pyelitis present, the inflammatory conditions commencing a year before orchectomy. The prostate is noted as small *per rectum*, but the lateral lobes were seen by the cystoscope to be much upraised towards the bladder, the bar at the vesical orifice being very oedematous and translucent. The bladder was fasciculated and pouched.

Result of Double Orchectomy.—The urine cleared in the first week, the stream improved in force, the pain on micturition diminished. At the end of the third week the prostate was slightly smaller, the structures of the lobes seemed more fibrous, and the interlobar line of demarcation had filled up. After three months the stream had markedly improved in force, and no symptoms, except slight variability in the power of the bladder, remained. Improvement maintained.

CASE IV.—Aged 76. Repeated attacks of retention and uræmia. Catheterisation most difficult. Prostate plump and elastic, only moderately enlarged towards the rectum. Suprapubic drainage for months without improvement to the cystitis. Double orchectomy. Cystitis rapidly diminished, and voluntary micturition was recovered in a fortnight, a stream of good force resulting. Prostate was slightly smaller at the end of the third week. Improvement maintained.

CASE V.—Aged 76. History of five years' dysuria, which was not much relieved by catheter. The instrument had to be passed every two hours, then every hour. Irrigation of the bladder had no control over the cystitis. Double orchectomy. Prostate slowly diminished in size; catheterisation was only needed every six hours; cystitis diminished, active occupation renewed.

CASE VI.—Aged 81. Patient had relieved the bladder with catheter for nine years. For several years he has had to catheterise six or seven times during the night and three times during the day. For the last three months he had experienced increasing difficulty in passing his instruments, and his efforts were often followed by hæmorrhage. Prostate *per rectum* was large and elastic, especially the left lobe. He was promised relief only. He was assured that by orchectomy the catheter would be needed less frequently, its introduction would be easier, and the cystitis would be reduced. Orchectomy. Result: For three days after the operation the catheter was only needed twice in twenty-four hours, then four times in the same period. At the end of three weeks the prostate had slightly diminished and the interlobar line of demarcation had filled in; the cystitis had greatly decreased, but the catheter had again to be used three times at night. No stone or other source of irritation was present.

CASE VII.—Aged 60. History of two or three years' dysuria, with occasional use of catheter, followed by cysto-prostatitis. A prostatic abscess formed and burst into the urethra. Intense pain experienced after every feeble attempt at micturition; finally retention. Catheterisation for a week. Prostate large laterally and elastic. Orchectomy. Recovery of voluntary micturition on third day; slight shrinkage of the prostate after two weeks. Pain diminished, but stream and frequency of micturition very variable. Pain gradually left, frequency became normal, but prostate still plump and elastic, perhaps diminished one-eighth by fourth week.

CASE VIII.—This patient, aged 46, applied to me after ten years' of skilled treatment for an aggravated prostatitis with great local pain, tenderness, and severe and intractable neuralgic radiations. There was also increased frequency of micturition. Sitting or walking was almost unbearable. Orchectomy. No marked relief as yet. Prostate slightly smaller. Final condition will be reported later.

CASE IX.—In progress.

All the above patients were in urgent need of relief, and they were selected from a large series of prostatic cases as being suitable for the operation. It will be noticed that they illustrate the use of the operation in four groups of cases.

1. Those cases in which castration was performed early—that is, before the vesical muscle had been permanently crippled, but not before it had been impaired.

2. Those in which the muscle power had been abrogated by years of catheterisation, and in which death was approaching from ascending pyelitis.

3. Those in which the ordinary obstructive symptoms were aggravated by chronic inflammatory troubles of the senile prostate.

4. One mid-adult case of incurable chronic prostatitis and vesiculitis which was complicated by unrelievable neuralgic radiations.

REMARKS UPON THE OPERATION AND ITS RESULTS.

Operative.—In every case of orchectomy in the aged which I have done, swelling, and in some cases suppuration, of the stump of the cord has taken place. The wound in two cases has had to be reopened for drainage. It might be contended¹ this was due to inefficient asepsis. I cannot but think that suppuration is induced by the inflamed bladder, microbes from which attack the wound; but traumatism of senile tissues also assists, and I would suggest that the greatest gentleness should be exhibited in dealing with the cord, that no stretching by pulling on the testicle should be permitted, and that a drainage tube should be invariably left for three or more days in contact with the surface of the stump when cystitis is marked. The inflammatory dangers of *bistourner* under these circumstances is too obvious for comment.

RESULTS.

(a) *Reduction in the Size of the Prostate.*—The prostate, commencing probably at or near the orifice of the bladder, and

¹ Clay Modelling of the Living Prostate as a Means of obtaining a Permanent Record of Progressive Disease. BRITISH MEDICAL JOURNAL, 1887, i, p. 1080.

around the openings of the ejaculatory ducts, is unquestionably absorbed. I believe that the large, soft, elastic, uninflamed prostates are only slightly diminished in actual size after three weeks, and it is some weeks, even months, before they are decidedly small *per rectum*. With the congested enlarged prostate it is perhaps slightly otherwise. I can conceive that a recently congested enlarged prostate is markedly reduced in volume after the first three weeks, because the diminution in its congestion removes much of its extravascular bulk, but its final reduction in size is probably as slow as that of others. I have a suspicion that the fibrous prostate, which is tough, hard, and small *per rectum*, does not become reduced so quickly as the soft, elastic, fibromyxomatous gland.

In some cases the first appearance of change in the contour of the prostate after orchectomy was a confusion between the lobes by a filling up of the interlobar groove, but of this I cannot speak definitely, because some prostates approach this type in senile enlargement. The mere reduction in size *per rectum* is, however, of secondary importance to the observed effects upon voluntary micturition.

(b) *Return of Voluntary Micturition.*—In those cases in which the muscle power was still present, though impaired, some return of normal micturition took place within the first week. But if the atony was pronounced the catheter could not be discarded. This is the weak point about all prostatic operations, a prognosis of the return of voluntary micturition depending in every case upon the muscle power of the bladder. Now, it is very evident that the muscular power of the bladder is not only impaired by prostatic obstruction but also by senile changes; and when patients apply for treatment, no matter how early the stage of the enlargement may be, some muscular weakness will be detected. And from this no aged patient ever recovers. He may be made comfortable by removing the prostatic obstruction, if this is done sufficiently early, but a strong stream is never regained. In all the cases in which I have done prostatectomy or castration in the aged, evidences of muscular weakness have remained. If the muscle of the bladder had not been placed *hors de combat* by retention or by confirmed catheterism, castration has certainly enabled the muscle to recover itself to some, often to an unexpected, extent. But the evacuating power remained capricious, and was influenced by the same conditions which affected it before the prostatic obstruction was removed. Thus, at one time the force appeared greater than at others. In the morning on rising a difficulty in emptying the bladder was still experienced, and several urinations at close intervals were necessary. Towards evening the force of the current generally improved. A cold, or an indiscretion in diet evoked frequency. If the bladder became over-distended, as in prolonged railway travelling, the stream was nearly always intermittent, the bladder being forced to complete by many efforts the work of evacuation which in middle age was accomplished in one steady expulsive contraction. The catheter even may be needed to assist the muscle if the over-distension has been great. Sudden stoppages, I have noticed, are still felt, but these may be due to the excess of mucous membrane at the base—left after the shrinkage of the subjacent enlargement—becoming rolled on to the vesical orifice.

(c) *Pus in the Urine.*—Not least among the advantages gained in some of the cases was the reduction in the amount of the pus present in the urine. Probably this may be accounted for to some slight extent by the effects of counter-irritation applied to the vertex of the bladder by means of the two wounds.

CONCLUSIONS.

1. There is no doubt that slow shrinkage of the prostatic tissue in many of the forms of senile enlarged prostate ensues upon double castration. Further experience must, however, decide as to whether every form of prostatic growth is thus affected.

2. It is certain that escape from catheter life after castration depends absolutely upon the health of the vesical muscle. The grade of the atony, therefore, should be most carefully estimated before any hopes of relief from catheterisation are held out. To promise a confirmed catheter case that orchectomy will do away with the instrument will merely bring discredit on the operation and disappointment to the

patient. Even after prostatectomy we are unable to promise such relief if the muscle is hopelessly atonic, and we cannot do so after castration.

3. It is possible that castration by diminishing the microbic infection from the inflamed senile prostate will remove a constant menace to the integrity of the kidneys, for it will control the most prolific source of ascending pyelitis.

It appears to me that double castration will prove of value in the following conditions:

1. In reducing bulky overgrowth of the lateral lobes of the prostate. It may be found that the small, tough, fibrous, median or lateral vesical outgrowths will be better removed by suprapubic prostatectomy.

2. In controlling the distress and danger of an inflamed senile enlarged prostate.

3. In lessening the frequency or difficulty of introducing the catheter in advanced or confirmed catheter life.

4. In avoiding the mechanical difficulty of crushing a post-prostatic on a post-trigonal stone, by levelling the base of the bladder, thus rendering the operation of litholapaxy feasible in a condition in which before it was impracticable.

5. In reducing chronic cystitis and recurrent phosphatic calculus in cases of confirmed catheter life.

AN ENLARGED PROSTATE GLAND EIGHTEEN DAYS AFTER BILATERAL OR COMPLETE CASTRATION.

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For permission to publish the account of the following case I am indebted to my colleague, Dr. Carver, under whose care the patient was while in hospital.

J. M., aged 74, a well-built and hearty-looking man, was admitted on October 10th, 1894, suffering from severe cystitis of many months' duration, the urine containing a large amount of mucus and pus. Micturition was very frequent and very painful, only a few drops being expelled at a time. Two years previously he was in the hospital for retention of urine, and since then he was in the habit of using a catheter. The prostate, as felt *per rectum*, was about as large as a medium-sized orange. As there was but little improvement from washing out the bladder and the frequent use of the catheter, and as there was much pain with little prospect of relief, he consented, as a last resource, to have his testicles removed. This was done on November 16th, 1894. The testicles were of full size, and in the left there was a large spermatocele. In each the production of spermatozoa was still going on, and in each there were numerous active spermatozoa in the seminal tubules.

On the following day (November 17th) the amount of urine found in the bladder was very small, but there was a great deal of pain in the loins, indicating partial suppression of urine. The next day more urine was secreted, and the pain in the loins was much less. There was, however, at times agonising pain in the bladder, though the amount of mucus and pus in the urine had somewhat decreased. At the end of the first week after the operation he could pass, for the first time for some weeks, a few ounces of urine without the aid of the catheter which was now only used twice daily. The urine still contained much pus. During the second week after the operation his general condition slightly improved and the bladder became quiet, and he was able to empty it fairly well; but towards the end of the second week he began to suffer from sleeplessness, which was soon followed by delirium; thus it was difficult to ascertain the condition of the urine, and on the fourteenth day after the operation the right popliteal artery became blocked, and the limb below showed signs of commencing gangrene. During the next four days he became gradually worse, the gangrene of the limb increased, and he died on December 3rd, 1894, eighteen days after the operation.

At the *post-mortem* examination the right kidney was found much enlarged from chronic hydronephrosis, and there was