REPORT
ON
THE CONDITION OF THE PROSTATE
IN OLD AGE,
FOUNDED ON
THE DISSECTION OF ONE HUNDRED SPECIMENS
IN
INDIVIDUALS OVER SIXTY YEARS OF AGE.

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THE difference of opinion as to the liability of the prostate gland to become enlarged in advanced life, has induced me to make some investigation into the actual condition of the part under these circumstances.

With this view, I have dissected the prostate in one hundred persons above the age of sixty; and I now have the honour to lay the result of my examinations before the Society. In order to facilitate the consideration of the cases, I have divided them into three classes, according to their weight.

We have thus, first, those under four drachms; second, those between four and six drachms; and third, those over six drachms.

My reason for adopting this arrangement, which at first sight may appear rather arbitrary, is, that we at once separate those glands which are most materially altered from those that are comparatively healthy.

It is evident that the weight of a prostate may generally be taken as a fair index to its condition, as to increase in bulk; and experience shows that glands weighing more than six drachms have become so altered as generally to inconvenience the patient. They must, therefore, be considered as hypertrophied, unless affected with some other disease.

Those between four and six drachms approach the normal size, which is given by Mr. Thompson,¹ one of the latest authorities on the subject, as four drachms thirty-eight grains; and as none of the individuals from whom they were taken had suffered during life any symptoms of urinary obstruction, we may fairly conclude that these organs did not exceed the natural proportions.

As to those under four drachms, which were evidently less than natural, it may be questioned whether, at any former time, they had been larger, and subsequently became atrophied; or whether the size they presented at death was their original condition.

I fear it will not be easy to settle this point: yet with the purpose of separating clearly what may be considered the normal from the abnormal, they have been arranged in a distinct class, and are as follows.

¹ 'The Enlarged Prostate,' by Henry Thompson, F.R.C.S., 1858, p. 10.

CLASS I.

Prostates under four drachms.

	No.	Age.	Weight.		No.	Age.	Weight.
			Drs. Grs.				Drs. Grs.
A	1	76	3 35		11	78	3 20
A	2	76	3 20		12	82	3 20
A	3	71	3 50		13	71	3 40
A	4	87	3 30		14	75	3 50
B	5	79	2 30		15	76	3 40
C	6	80	3 5		16	67	2 20
	7	67	3 20		17	70	3 20
	8	69	2 40		18	75	3 20
	9	85	2 40		19	83	2 5
	10	77	3 40		20	74	3 0

		Min.	Max.	Med.
Which gives	Age	67	87	75·9
	Weight...	Drs. Grs. 2 5	Drs. Grs. 3 50	Drs. Grs. 3 10

A. Cases in which commencing circumscribed tumours were found, four in number.
 B. Abscess in both lateral lobes, the consequence of stricture, one case.
 C. Posterior lobe enlarged, one case.

CLASS II.

Prostates between four and six drachms.

	No.	Age.	Weight.		No.	Age.	Weight.		No.	Age.	Weight.
			Drs. Grs.				Drs. Grs.				Drs. Grs.
A	1	81	5 0	B	16	80	4 20		31	81	4 20
A	2	82	5 5		17	67	5 40		32	76	4 10
A	3	68	5 50		18	78	5 0		33	64	4 0
A	4	78	5 30		19	76	4 0		34	81	5 0
A	5	82	5 0		20	76	4 40		35	84	4 40
A	6	71	5 30		21	66	5 20		36	82	4 50
A	7	69	5 0		22	84	5 0		37	75	5 15
A	8	87	5 10		23	85	4 30		38	60	5 0
A	9	85	4 30		24	74	4 40		39	73	4 30
A	10	81	6 0		25	94	5 0		40	71	5 30
A	11	71	4 30		26	75	4 30		41	73	5 0
A	12	76	5 30		27	61	4 20		42	68	4 0
C	13	82	5 50		28	81	5 20		43	70	4 0
C	14	85	5 30		29	76	5 30		44	68	5 0
B	15	72	4 30		30	84	5 20		45	77	6 0

		Min.	Max.	Med.
Which gives.....	Age	60	94	76·2
	Weight...	Drs. Grs. 4 0	Drs. Grs. 6 0	Drs. Grs. 4 57

A. Cases in which circumscribed tumours were observed, twelve in number.
 B. Abscess existed in these two cases.
 C. Slight enlargement of posterior lobe, two cases.

CLASS III.

Prostates over six drachms.

No.	Age.	Weight.	Part enlarged.	Nature of enlargement.
		Drs. Grs.		
1	72	28 0	All lobes.	Tumours.
2	77	9 20	do.	do.
3	77	6 20	do.	do.
4	63	14 0	do.	do.
5	80	19 30	do.	do.
6	86	7 20	do.	do.
7	87	7 30	do.	do.
8	75	16 0	do.	do.
9	78	33 0	do.	do.
10	71	10 0	do.	do.
11	70	10 0	do.	do.
12	76	10 0	do.	do. [tumours.
13	72	17 0	do.	Fibrous hypertrophy, without
14	79	12 0	do.	do.
15	81	6 35	do.	Fibrous hypertrophy, with abscess.
16	79	30 0	do.	do.
17	76	24 0	do.	Tubercle.
18	78	30 0	Lateral lobes chiefly.	Tumours.
19	76	48 0	do.	do.
20	74	25 0	do.	do.
21	62	6 15	do.	do.
22	74	7 10	do.	do.
23	78	7 5	do.	do.
24	77	6 15	do.	do.
25	64	14 0	do.	do.
26	84	26 30	do.	do.
27	75	7 0	do.	do.
28	71	9 30	do.	do.
29	77	9 30	do.	do.
30	60	14 0	do.	Tumour, with abscess.
31	81	12 0	do.	Fibrous hypertrophy, without tumours.
32	67	17 0	[only.	do.
33	74	9 10	Left lateral & posterior lobes	Tumours, with abscess.
34	81	8 30	Right lateral lobe chiefly.	Fibrous hypertrophy, with absces.
			Left lateral lobe only.	Tumours.
35	80	8 30	Posterior lobe chiefly.	

Which gives	{	Min.	Max.	Med.	
		Age	60	87	75.2
		Weight...	Drs. Grs. 6 15	Drs. Grs. 48 0	Drs. Grs. 15 2

Thus it appears that 35 per cent. of all prostates after the age of sixty are abnormally large; 20 per cent. are abnormally small; and 45 per cent. are within the limits of the normal weight.

It appears from the nearly equal average age in all three classes, that the condition of the prostate does not materially affect the longevity of the individual. A slight difference, however, does exist in favour of those in whom the gland is most nearly normal; the average in these being 76·2, and in the enlarged 75·2.

Nature of Enlargement.

This enlargement, which is found in 35 per cent. of all prostates after sixty years of age, is produced principally by hypertrophy of the fibrous tissue which naturally exists in the organ. The gland-follicles also become enlarged, and more numerous, but do not affect the size of the organ to the same extent as the fibrous development.

This new tissue may be found deposited equally throughout the organ, which in that case presents on section a smooth and even surface; but most generally it is seen to be exaggerated at certain parts, producing, in some instances, tumours, which start out from the surface of a section and make it irregular. Between these two conditions there are many gradations; the fibrous tissue may be seen lying in concentric layers of greater or less size, and more or less distinctly marked; giving the appearance as if, by their increase and progressive hardening, they gradually led to the formation of tumours.

Their minute characters and mode of formation have already been so well described by different authors, that they need not be entered into here.

The frequency of this fibrous deposit is shown by the fact, that of the thirty-five cases of enlargement it existed in thirty-four. In seven of these there was no appearance of tumours; in twenty-seven they were present in various degrees of development.

It may be remarked that these tumours are not peculiar to the enlarged condition of the gland, for they were found in four of the abnormally small glands and in twelve of the normal; so that they exist in 43 per cent. of all prostates after sixty years of age, and we may reasonably conclude that their presence in the smaller prostates indicates a tendency to enlarge, which, with a few years' longer life to the patient, might have become developed, and have caused him serious inconvenience.

With regard to the tumours found in the smaller glands, those between four and six drachms and under four drachms, it must be understood that they were not distinctly marked, or capable of being readily separated from the surrounding tissue, as was frequently the case in those glands where they had attained a greater development; but they appeared to be only in the incipient stage: that is, at one or more particular spots, the fibrous tissue was seen to have become hardened, probably from additions to its material, having a firm feel on pressure, appearing as if it had contracted upon the included softer tissue, and giving a slightly nodulated appearance to a section. These appearances may be gradually traced, becoming more and more marked as the development of these tumours advances, or as further additions to the fibrous tissue are deposited.

Seat of Enlargement.

It is of importance to determine which part of the prostate is most liable to enlargement, as the flow of the urine is much more likely to be obstructed by enlargement of one portion than of another.

From the peculiar relation of the posterior lobe to the mouth of the bladder, it is easily understood how the projection of it, when enlarged, more seriously obstructs the passage of the urethra than when the lateral lobes alone are increased in size. The relative frequency of enlargement of these parts, in the thirty-five enlarged glands, will be observed in the following table:

Table showing the frequency of enlargement in different parts in thirty-five cases.

In	17	enlargement existed in all three lobes, pretty equally.							
"	14	"	"	in both lateral lobes chiefly.					
"	1	"	"	in left lateral and posterior lobe.					
"	1	"	"	in right lateral lobe mostly.					
"	1	"	"	in left lateral lobe alone.					
"	1	"	"	in posterior lobe chiefly.					

Thus it appears that enlargement of the posterior lobe is not of so frequent occurrence, comparatively with increase in other parts of the organ, as was at one time supposed. In a little more than a half of all enlarged glands, it is found, either associated with enlargement of the other parts, or singly—by far most frequently the former; and among the sixty-five glands under six drachms weight, only one case occurred in which this portion had become developed to a degree that might be supposed capable of opposing the flow of urine. We have thus 20 per cent. of all prostates over sixty years of age, in which the posterior lobe forms an obstruction at the mouth of the bladder.

The occurrence of only one case throughout the whole series, in which the posterior lobe alone was enlarged so as to cause obstruction, the other parts being healthy, shows the rarity of that condition of the prostate.

The particulars of this case are perhaps worth mentioning. It is No. 6 in Class I. The gland was considerably under the average size, weighing three drachms five grains. No irregularity of shape was noticeable till the bladder was opened, when the posterior lobe was found elongated, and rising as a valve over the mouth of the urethra, so as, when applied, to close it almost completely.

That it had caused obstruction to the escape of urine, although the patient never had been under treatment for such symptoms, was evident from the fasciculated state of the bladder, while the urethra itself was free from stricture. It may be doubted whether this projection should be con-

sidered a true hypertrophy of the posterior lobe; for it seemed to be not more intimately connected with that part of the prostate, than with a large fasciculus of the muscular coat of the bladder, which passed from the mouth of the urethra, along either side of the trigone; but wherever it originated, it effectually acted the part of an enlarged posterior lobe, and therefore I have classed it with these cases.

Serious opposition to the flow of urine may also arise from enlargement of the lateral lobes, especially when tumours exist, and lie towards the centre of the organ; as then they may project, and encroach upon the canal of the urethra, distorting it to the right or left, and narrowing the passage to a mere chink, while at the same time its extent of surface is greatly increased. The obstruction from this cause, however, although impeding the escape of urine, is not likely ever to do so to the same degree as enlargement of the posterior lobe; nor does it present so serious an obstacle to the passage of an instrument into the bladder.

It may be remarked that, in cases where the hypertrophy is advanced, and the tumours tend inwards, the urethra becomes greatly expanded, and the interspaces between the rounded sides of the projections into it, serve as channels for the urine to pass away by. This condition will frequently explain, I have no doubt, the occasional absence of symptoms of obstruction in cases where the prostate is known to be considerably enlarged.

Frequency of Symptoms.

The most important symptom indicating the presence of enlarged prostate, and, at the same time, the most direct result of the condition of the parts, is retention of urine, either complete or partial. It is of consequence to know, however, that this symptom does not present itself in every case of enlargement.

The proportion of men in advanced years suffering from

the consequences of enlarged prostate, is indeed small. Thus, amongst 1600 old men, with an average sick-list of 200, not more than ten are under treatment for this disease; and half of these only occasionally. A much larger number must be affected with enlargement of the gland, as shown by the results of post-mortem examination; but, from a variety of causes, although in several probably symptoms were present, they did not seek medical aid. Of the thirty-five cases of enlargement, fifteen made no complaint to the medical officer during life; with the exception of three in whom symptoms appeared after lesions of the nervous system. The following table shows the nature and extent of the alteration in the glands, in these cases:

Table showing the nature and extent of alteration in fifteen cases of enlargement, without symptoms.

No.	Age.	Weight.		Part affected, and how.
		Drs.	Grs.	
1	80	8	30	Posterior lobe chiefly; lateral lobes slightly; tumours.
2	81	8	30	All lobes; tumours; abscess of left lateral lobe.
*3	80	19	30	All lobes; tumours; apoplexy.
4	62	6	15	Lateral lobes; tumours.
5	74	7	10	Ditto ditto.
6	78	7	5	Ditto ditto.
7	77	6	15	Ditto ditto.
8	86	7	20	Ditto ditto.
*9	64	14	0	Ditto ditto; softening of brain.
10	84	26	30	All lobes; tumours.
11	87	7	30	Ditto ditto.
12	75	7	0	Lateral lobes; tumours.
13	71	10	0	All lobes; tumours.
14	71	9	30	Lateral lobes; tumours.
*15	79	12	0	Posterior lobe chiefly; lateral lobes less so; tumours; apoplexy.

* Symptoms, in these cases, appeared after lesions of the nervous system.

Although many of these cases were not greatly enlarged, some of them, as Nos. 1, 3, and 10, plainly showed that the prostate may be very greatly altered and enlarged, and yet the patient be free from urinary obstruction.

Case 1, æt. 80, died of pneumonia, and never suffered symptoms of urinary obstruction. The prostate weighed eight drachms thirty grains. The posterior lobe was prominently enlarged, projecting in a triangular shape, and covering the mouth of the bladder.

Case 3, æt. 80, died of apoplexy two months after the attack, and had not previously suffered urinary symptoms. The prostate weighed nineteen drachms thirty grains, and was hypertrophied in all its parts. Tumours were abundant, and encroached on the urethra, especially on the left side, from which a pyriform growth arose, near the veru montanum: passing backwards, its rounded extremity projected through the mouth of the bladder. A similar growth, but of less size, existed on the right side.

Case 10, æt. 84, died of pneumonia, and had no urinary symptoms. The prostate weighed twenty-six drachms thirty grains. The enlargement was principally seated in the lateral lobes, but the posterior also projected slightly. Tumours were abundantly developed.

Case 3 also shows, what is commonly remarked, that the enlarged condition of the gland may exist unnoticed until the powers of the system are broken down, and the bladder paralysed from some nervous lesion. Then the expelling force is impaired, and the unnatural obstruction discovers itself.

OTHER CONDITIONS.

Concretions.

The other alterations of the prostate besides enlargement, which were noticed in these dissections, were comparatively rare, with one exception. I refer to the presence of the small black concretions; and perhaps this ought not to be considered as an alteration, as in every case where they were looked for they could be discovered, either by the unaided eye or by the microscope. Nor could any special condition of the organ be connected with their presence, as

they were found in glands of all sizes, and in every variety of alteration. I am therefore disposed to consider them as normal to the gland in advanced life, rather than as a diseased condition in any way affecting the patient.

Abscess.

Abscess in the prostate appears rather as a consequence of obstruction to the flow of urine than as a disease likely to produce that condition. The cases I have met with seemed to arise from such causes as stricture of the urethra, obstruction at the mouth of the bladder from enlarged third lobe, or paralysis of the bladder; all tending to produce retention of urine, with its usual accompaniment of inflammation of the mucous surface of the bladder. The irritation seemed to have extended from this, and to have produced the suppuration in the prostate.

The frequency of abscess in the enlarged gland is in the proportion of five in thirty-five; in the non-enlarged, two in sixty-five.

The principal facts connected with these cases may perhaps be best seen by the following table:

Cases of Abscess of Prostate.

No.	Age.	Weight.		Probable cause.	Position of abscess.
		Drs.	Grs.		
1	79	2	30	Stricture of urethra.	Lateral lobes.
2	74	9	10	ditto.	Right lateral lobe.
3	60	14	0	ditto.	Posterior lobe.
4	81	6	35	Enlarged posterior lobe.	Posterior lobe.
5	81	8	30	ditto.	Left lateral lobe.
6	79	30	0	Enlarged posterior lobe, combined with paralysis of bladder.	Posterior lobe.
7	80	4	20	Paralysis of bladder.	Right lateral lobe.

Abscess in the prostate does not generally attain any great size. Although both lateral lobes are sometimes

found quite excavated by suppuration, yet the capsule of the prostate, and the structure of the gland itself, offer such opposition to extension, that the pus generally soon makes its way into the urethra, by one or more openings, most frequently in the neighbourhood of the veru montanum.

Tubercle.

Tubercle is the only other abnormal affection of the prostate, giving rise to enlargement, which I have noticed; and that only in one case. The patient was aged seventy-six. The gland was affected chiefly at its circumference, the parts around the urethra being comparatively healthy. The neighbouring cellular tissue and the vesiculæ seminales were involved, producing a large tumour between the rectum and bladder; the prostatic portion of which, when removed, weighed about twenty-four drachms. A similar deposit was found in the lungs, in the right kidney, and in the mucous membrane of the bladder. This case is No. 17 of Class III.

Calculi.

It may be interesting, in conclusion, to note the occurrence of urinary calculi in connection with enlargement of the prostate.

In three cases, Nos. 3, 4, and 23 of Class III, urinary calculi were discovered in the bladder, on dissection. In Case 3 two uric-acid calculi, each about half a drachm in weight, were found. Great obstruction existed at the mouth of the bladder, and the man died suddenly, from rupture of the coronary artery of the heart, while making violent straining efforts to void water.

In Case 4 two phosphatic concretions were found; one weighed seven drachms forty-five grains; the other, thirty-five grains. A curious provision existed, in this case, for the protection of the mouth of the bladder, consisting of a projection from either lateral lobe of the prostate, close to the opening of the urethra; the two swellings served as

buttresses, to defend the orifice from the calculus, and, at the same time, kept it free for the passage of urine.

In Case 23 one small phosphatic calculus was found, apparently of comparatively recent formation.

When we consider the favorable circumstances for the formation of phosphatic concretions in cases of enlargement of the prostate, where a pouch exists below the level of the mouth of the bladder, which can rarely be completely emptied, and must therefore favour the accumulation of sedimentary matters, it is surprising that calculi are not more frequently found.