

A METHOD OF PREVENTING THIRST AFTER CELIOTOMY,  
WITH A STUDY OF THE URINE.<sup>1</sup>

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BY

WILLIAM H. HUMISTON, M.D.,

Associate Professor of Gynecology in the Medical Department of Western Reserve University; Gynecologist to St. Vincent's Charity Hospital; Consulting Gynecologist to City Hospital, etc.,  
Cleveland, Ohio.

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IN the Transactions of the Section on Gynecology, College of Physicians of Philadelphia, as published in the February, 1896, number of THE AMERICAN JOURNAL OF OBSTETRICS, occurs an interesting discussion by well-known surgeons of that city in regard to the quantity of urine passed after abdominal section.

Dr. Baldy said: "I have noticed *for years* that the patients will pass, after abdominal section, as little as six ounces in twenty-four hours, very frequently eight to ten, where they passed thirty to forty before."

Dr. Noble is quoted thus: "About two years ago I tabulated every case. My experience is that twenty ounces in the first twenty-four hours after abdominal section *is a large quantity.*"

Dr. Howard Kelly, in discussing this subject before the American Gynecological Society, said, after continuous observations for the last three years of the urine following celiotomy, he had found that it required a period of ten days in the average case for the quantity of urine to become normal, beginning with a diminution of from one-third to one-half on the first day and gradually increasing.

The method of preventing thirst following celiotomy that I first published in July, 1895, in THE AMERICAN JOURNAL OF OBSTETRICS, has continued to give the same uniform results that the twelve cases which were then reported gave promise.

For the past two years the following has been my method—adopted because it was so efficient in overcoming the intense and distressing thirst which follows celiotomy, and continued because the thirst *is allayed* and the quantity of urine almost quadruply increased, together with a remarkable increase in the total amount of urinary solids excreted.

The method: "The patient should have the usual preparation

<sup>1</sup> Read before the Ohio State Medical Society, at Columbus, May 29th, 1896.

for celiotomy—*i. e.*, diet, daily baths, cathartics, etc. For three days prior to operation order the patient to drink one pint of hot water an hour before each meal and on retiring, thus drinking two quarts of water each twenty-four hours, the last pint to be taken three hours before the time set for operating. Do not omit to give the water the day previous to the operation, while the patient is restricted to a limited amount of liquid nourishment and the bowels are being unloaded. We thus restore to the system the large loss of fluid occasioned by the free catharsis, and we have the great satisfaction of seeing our patient pass through the trying ordeal of the first thirty-six hours after the operation in comparative comfort, with no thirst, a moist tongue, and an active renal function, represented by an excretion of from twenty-eight to fifty fluidounces of urine during the first twenty-four hours, catheterization being seldom necessary."

The convalescence has been rapid and entirely free from the restlessness that is produced by the dry tongue and extreme thirst in those cases where this method has not been used. The pulse has been full, regular, and strong, which is in keeping with the active renal function noted. In septic cases that come for operation, the weak heart action and the diminished renal secretion are prominent symptoms, and, if a crisis is not imminent, I delay operation for a few days, giving time for the hot-water method to be used. Within a short time I have had twenty-four consecutive celiotomies, with one death from heart clot occurring in thin and dilatable walls. I refer to these cases merely to demonstrate the severe test that I have given this hot-water method.

I beg leave to briefly report the results obtained in two cases.

Mrs. D. Diagnosis, ruptured ectopic pregnancy with general peritonitis and sepsis. For eighteen hours previous to entrance to my hospital the patient passed but six ounces of urine. Was admitted September 23d, 1896, at 7:30 P.M. Preparation of patient began immediately and continued through the night. Patient passed four ounces during the night, this containing fifty per cent albumin, compound granular casts, degenerated kidney epithelium, and general débris. Chloroform was administered for one hour and fifteen minutes; heart stimulants were freely given during this time. The operation was extremely difficult, as old dense adhesions, together with more recent ones, were encountered. There was also a large intraligamentous cyst of opposite side, which was enucleated. Two

quarts of normal salt solution were injected into the colon while patient was still in the Trendelenburg position. Patient left the table in an extremely low condition. However, in the first twenty-four hours the patient passed twenty-eight ounces of urine with seven hundred and seventy grains of total solids—the albumin being very much diminished; in the second twenty-four hours, twenty-four ounces of urine with six hundred and seven grains solids, with only a faint trace of albumin; on the seventh day, forty-eight ounces and five hundred and twenty-eight grains solids, with still a trace of albumin, but no casts found after four hours of sedimentation. That is, this patient was operated upon under most unfavorable conditions, with suppression of urine, general toxemia, and without even ordinary preparation for an operation; and yet, by the administration of large quantities of water by stomach and bowel during the twelve hours preceding the operation, and by the addition of two quarts of salt solution while on the table, the kidneys were made to excrete an average of twenty-six ounces of urine with six hundred and eighty nine grains of total solids during the first two days, and the patient's life was saved.

Mrs. D. Diagnosis, a large and rapidly growing ovarian cyst, general sepsis, acute septic parenchymatous nephritis. Three weeks prior to admission to my hospital I opened, through the vagina, a large pyosalpinx, preparatory to the removal later of the then large ovarian cyst by celiotomy. The patient's general condition failed to improve, however, and there were evidences of absorption of septic matter still continuing; and, further, the ovarian cyst very rapidly increased in size. For ten days previous to admission the kidneys were excreting daily from eight to fifteen ounces of urine with a low specific gravity, in spite of the rather vigorous measures adopted for increasing the amount. During the week allowed for preparation of the patient, under the administration of strychnia and potassium bitartrate and copious and frequent draughts of hot water, the kidneys more than doubled the largest quantity passed in the period of ten days prior to admittance, together with the total solids. Upon opening the belly the adhesions were found to be general and very dense; the bleeding, too, was quite free. The wall of the cyst was stitched to the abdominal parietes in the lower angle of the incision, and the cyst contents of one hundred and ten ounces of thick pus (pea soup) were evacuated by trocar and canula. The cyst cavity was carefully flushed and packed with iodoform gauze. This patient

passed, during the first two days succeeding the operation, an average of sixteen ounces with three hundred and eighty-seven grains of total solids. On the fifth day fifty ounces were voided with six hundred and five grains of solids. The patient made an uneventful and rapid recovery, but the kidneys had not fully regained their tone in the four weeks she remained in my hospital.

These two cases, together with the average of the last twenty-four cases in which more careful and full tabulation has been kept, are sufficient to show the value of my water method.

The estimation of the total solids is according to Haines' modification of Heuser's method, multiplying the quantity in ounces of urine passed in twenty-four hours by the last two figures of the specific gravity, and the result by the coefficient one and one-tenth. The table of total solids for the normal case according to body weight is by Etheridge.

The average of total urinary solids voided during the first twenty-four hours succeeding admission to "The Home" was four hundred and forty-seven grains; the average total quantity of urine was twenty nine ounces. During the day preceding the operation thirty ounces of urine, containing four hundred and ninety-one grains of total solids, were excreted.

The average quantity of urine voided during the first twenty-four hours following operation was thirty-one and a half ounces, and the average total solids were nine hundred and seventy-two grains; in the second twenty-four hours twenty-five ounces of urine, containing six hundred and eighty grains of total solids, were passed. The average total quantity of urine voided during the first twenty-four hours following admission to the hospital is above that of the ordinary gynecologic case, I believe.

Upon the first consultation I always advise the use of *at least* an ordinary amount of water, together with the administration of the usual diuretics, especially the potash and soda salts, with occasionally digitalis. This accounts, in all but two cases of the twenty-four, for the large amount excreted.

I wish particularly to call your attention to the enormous increase in the amount of the total solids eliminated during the first twenty-four hours after the operation over that of the preceding twenty-four hours—from four hundred and ninety-one grains to eight hundred and seventy-one grains, *showing a gain of almost eighty per cent.*

Just a few days ago I succeeded in securing the twenty-four

hours' urine from six healthy females, which I had examined with the following results: Their average weight being one hundred and fifteen pounds, the normal total solids (according to Etheridge) should be nine hundred and forty-five grains; the average quantity of urine passed was thirty-seven ounces, containing an average of total solids amounting to six hundred and seventy-seven grains. The comparison of the results between the operative cases and healthy subjects is interesting, showing how nearly my patients approach at least the normal quantity, and how they so far surpass the elimination of total solids immediately following abdominal section.

There is another point to which I wish to call attention, if you will permit me to digress, and that is the value of lavage in persistent vomiting after celiotomy. The results were so striking and immediate in two desperate cases, after failure to control vomiting by every known method, that hereafter I shall adopt and advise washing of the stomach thoroughly an hour before operation in cases that have been troubled with gastric irritability for a length of time.

Number of case.	Name.	Weight of patient.	Urine passed in twenty-four hours upon entrance.		Urine passed for twenty-four hours preceding operation.		Normal quantity of total solids which each patient should pass according to her weight.		Quantity of urine passed during first twenty-four hours.		Total solids passed during first twenty-four hours after celiotomy.		Quantity of urine passed second twenty-four hours.		Total solids passed during second twenty-four hours.		Average quantity of urine passed during first two days.		Average quantity of total solids passed during first two days after celiotomy.	
			Lbs.	Ozs.	Grs.	Ozs.	Grs.	Grs.	Ozs.	Grs.	Ozs.	Grs.	Ozs.	Grs.	Ozs.	Grs.	Ozs.	Grs.	Ozs.	Grs.
1	Mrs. C. ....	85	..	..	..	..	752	25	683	23	607	24	620							
2	Mrs. K. ....	100	..	..	..	..	854	35	1001	17	561	26	731							
3	Mrs. M. ....	140	..	..	..	..	1078	53	1233	32	915	42 $\frac{1}{2}$	1069							
4	Mrs. F. ....	90	..	..	..	..	790	23	688	18	574	20 $\frac{1}{2}$	623							
5	Mrs. D. ....	154	..	..	..	..	1150	33	770	24	607	26	686							
6	Mrs. M. ....	120	..	..	..	..	974	32	915	26	868	29	887							
7	Mrs. H. ....	105	48	422	18	387	864	33	944	26	744	29 $\frac{1}{2}$	844							
8	Mrs. K. ....	140	20	396	32	596	1078	32	862	26	858	26	802							
9	Mrs. S. ....	110	34	493	35	501	916	34 $\frac{1}{2}$	1025	24	845	29	925							
10	Mrs. R. ....	120	36	752	39	686	974	31 $\frac{1}{2}$	623	29	638	30	630							
11	Mrs. W. ....	100	..	..	30	462	854	25	605	23	531	24	568							
12	Mrs. S. ....	165	..	..	43	482	1217	25	880	35	770	30	825							
13	Mrs. G. ....	125	15	281	24	475	1053	16	399	15 $\frac{1}{2}$	375	16	377							
14	Mrs. B. ....	106	32	337	32	634	835	37	895	40	890	38 $\frac{1}{2}$	838							
15	Mrs. C. ....	100	38	460	29	472	854	32	890	40	704	36	732							
16	Mrs. B. ....	140	..	..	26	429	1078	48	950	28	610	35	788							
17	Mrs. C. ....	120	32	634	56	952	974	29 $\frac{1}{2}$	846	18	559	23 $\frac{1}{2}$	702							
18	Mrs. W. ....	130	14 $\frac{1}{2}$	478	24	686	1028	34	1074	19	564	31 $\frac{1}{2}$	819							
19	Mrs. B. ....	120	26	605	30	550	974	33	944	30	616	21 $\frac{1}{2}$	730							
20	Mrs. G. ....	150	26	484	15	479	1150	32	1056	25	743	23 $\frac{1}{2}$	900							
21	Mrs. H. ....	95	33	390	33	390	821	33 $\frac{1}{2}$	847	20	528	27	685							
22	Mrs. L. ....	110	11	350	24	581	916	29 $\frac{1}{2}$	974	22	678	26	686							
23	Mrs. L. ....	160	43	686	30	660	1198	32	950	23	862	30	906							
24	Mrs. A. ....	110	19	564	31	618	916	26 $\frac{1}{2}$	758	27	594	27	622							
Average ....		121	29	477	30	491	972	31 $\frac{1}{2}$	871	25	680	27	771							