THE RESULTS OF CELIAC GANGLIONECTOMY IN CASES OF ESSENTIAL HYPERTENSION

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The criteria on which rests the evidence of the presence of essential hypertension are reliable. These are an increase in the diastolic blood pressure, a change in the eye grounds and often in the kidneys, and the patient's own story of disability and distress. Equally evidential are the postoperative findings, among which most significant of all is the patient's own story—whether or not he is able to go back to his usual occupation; whether or not the symptoms which were present before operation have disappeared. The important fact is that a fall in blood pressure is not the only criterion upon which to base the effects of any procedure for the treatment of essential hypertension. The eye grounds, the kidney function, the state of the heart and, most important of all, the subjective effects must be considered. The presence of sclerosis is not a criterion. Sclerosis may be present in any disease; it is not uncommon in the sixth and seventh decades of life. If the hypertension was initiated in younger years, sclerosis may have become established as a result of the disease by the time the patient comes to operation. This sclerosis will not disappear even though the hypertension is completely arrested. It should be noted, as our follow-up studies have shown, that when a certain advanced degree of sclerosis has been reached, the blood pressure cannot return to the normal level, an observation which is analogous to that of the sclerosis of old age. In old age the sclerosis which develops in the arterial walls is the basis for the changes in the blood pressure which are characteristic of advancing years.

It is clear that the patient with a malignant phase of hypertension is in a plight comparable to that of the patient who has a cancer of the stomach, of the colon, of the breast, of the cervix. Long experience in the treatment of cancer has shown that patients, even with definitely incurable cancer, are willing and anxious to undergo surgical operations, and radium and x-ray treatments, in order that their discomforts and disabilities may be ameliorated. Moreover, even in operable cases, the treatment of cancer is effective in only a certain percentage of cases. The treatment of cancer of the cervix with radium, for example, seems highly satisfactory when, at the best, only 25 per cent of the patients are cured. It follows that if we can state that by the surgical treatment of hypertension the symptoms are relieved in 25 per cent of the cases and the hypertension is cured in 25 per cent, this should be considered a satisfactory treatment for hypertension. It is true that a longer time must elapse before "five year cures" can be reported for our later procedures, but for cancer, reports of one, two and three year results are given as indications of what is to be hoped for in the five year

period. In a series of 69 consecutive cases on which follow-up data are available, symptomatic improvement was noted in 95 per cent on discharge from the hospital; in 87.8 per cent, 72.3 per cent, and 78.3 per cent respectively in 1 to 3 month, 4 to 6 month and 7 to 12 month post-operative periods. Among 15 cases of advanced malignant hypertension, the symptomatic results were favorable in 94 per cent on discharge from the hospital; in 87 per cent in a 1 to 3 month period; in 50 per cent in a 4 to 6 month period, and in 86 per cent in a period of more than one year.

Choice of Operative Procedure

Our experience in the surgical treatment of essential hypertension includes 358 operations on the adrenal sympathetic system in 213 patients. Of these, 206 have been celiac ganglionectomies in 129 patients. As the result of this experience, we have selected celiac ganglionectomy with denervation of the adrenal glands as the procedure of choice, as we have found that, symptomatically and in its effects upon the blood pressure, this operation yields the most encouraging results.

As for the operative mortality, we can state that among the last 112 individual celiac ganglionectomies there have been two deaths—a mortality rate of 1.8 per cent.

Symptomatic Relief

A study of our case histories has shown that in some cases there has been complete relief and in many cases marked relief from the subjective symptoms which accompany essential hypertension—relief from fatigue, headaches, heart consciousness, dizziness, mental confusion. The eyesight has improved. Many patients have been able to return to their usual occupations even though the blood pressure has not been restored to the normal level. Even though the blood pressure has been reduced only from 280/150 to 180/120 or 200/130, the subjective improvement may be marked. Moreover, these patients tend to become calmer and more equable in temperament and thus, even in cases in which the blood pressure remains well above the normal level, the violent uprushes of the blood pressure with the disastrous results which accompany emotional outbursts may be prevented. An analysis of the negative effects of celiac ganglionectomy also gives significant findings. Celiac ganglionectomy does not interfere with metabolism; it does not interfere with function of the digestive tract; it does not interfere with the function of the genito-urinary tract; there are no orthostatic effects; there are no abnormal changes in the daily blood pressure; there are no changes in the skin; there has been no instance of adrenal insufficiency; there is no change in the rate of activity of the heart; there is no change in sex function; there is no ocular interference.

The large majority of the patients operated upon for hypertension report a one to five year duration of symptoms. The duration of symptoms ranged, however, from one month to 25 years. A study of our results has shown that the duration of symptoms had little effect upon the symptomatic results of celiac ganglionectomy and our analysis has shown that the same is true for the other types of operation.

As for individual symptoms, we shall offer a few facts derived from our study of the effects of celiac ganglionectomy. Forty-eight patients complained of headaches. All were relieved when they were discharged from the hospital, with complete relief in 14 per cent. During the first three months following the operation, 87 per cent were relieved and of these, 30 per cent had experienced complete relief. During the 7 to 12 month postoperative period, 100 per cent were relieved and 42 per cent were completely relieved.

Thirty-six patients complained of nervousness when they entered the hospital. Ninety-four per cent were improved on discharge from the hospital and 16 per cent were completely relieved. During the 1 to 3 month postoperative period, 88 per cent were improved and 12 per cent were completely relieved; during the 4 to 6 month period 77 per cent were improved and 29 per cent were completely relieved; and during the 7 to 12 month period 89 per cent were improved and 22 per cent were completely relieved.

Twenty-eight patients complained of palpitation when they entered the hospital. On discharge from the hospital all were improved and 25 per cent were completely relieved. During the 1 to 3, and 4 to 6 month postoperative periods, 90 per cent and 100 per cent respectively were improved and 25 and 29 per cent respectively were completely relieved. None of the patients reporting during the 7 to 12 month period made reference to the presence or absence of this symptom.

A similar story might be told regarding each of the other symptoms which are characteristic of essential hypertension.

TABLE I

Effects of Bilateral Celiac Ganglionectomy on the Blood Pressure

	No. of Cases	*Adm.*	*End of Period*	*Dif.*
In Hospital	69	220/130	169/111	–51/19
1–3 Mos. Postop.	55	219/135	181/115	–38/20
4–6 Mos. Postop.	33	236/138	191/118	–45/20
7–12 Mos. Postop.	19	221/134	193/119	–28/15

TABLE II

Effects of Bilateral Celiac Ganglionectomy on the Systolic Blood Pressure

Systolic Pressure Reduced	*No. of Cases*	*20 Pts. or More*	*40 Pts. or More*	*60 Pts. or More*	*80 Pts. or More*	*100 Pts. or More*
On Discharge from Hospital	69	92.8%	59.4%	31.9%	16 %	7.2%
1–3 Mos. Postop.	55	78.2%	56.4%	20 %	5.5%	0
4–6 Mos. Postop.	33	66.6%	51.5%	12.1%	6 %	0
7–12 Mos. Postop.	19	63.2%	31.6%	21 %	5.3%	0

TABLE III

The Effect of Bilateral Celiac Ganglionectomy on the Diastolic Pressure

Diastolic Pressure Reduced	*No. of Cases*	*10 Pts. or More*	*20 Pts. or More*	*30 Pts. or More*	*40 Pts. or More*	*50 Pts. or More*
On Discharge from Hospital	69	73.9%	58 %	40.6%	26 %	14.5%
1–3 Mos. Postop.	55	71 %	58 %	40 %	25.6%	9 %
4–6 Mos. Postop.	33	64.7%	53 %	26.5%	14.7%	2.9%
7–12 Mos. Postop.	19	68 %	47.9%	15.8%	5.3%	0

TABLE IV

Reduction of Blood Pressure to Normal as Result of Bilateral Celiac Ganglionectomy

	On Discharge from Hospital	*1-3 Mos. P. O.*	*4-6 Mos. P. O.*	*7-12 Mos. P. O.*
No. of Cases	69	55	33	19
Completely Normal	27.5%	18.2%	18.2%	15.8%
Blood Pressure on Admission	197/119	192/126	198/122	193/128
Diastolic Normal	40.6%	41.8%	30.3%	47.4%
Blood Pressure on Admission	213/124	206/124	204/125	215/123
ystolic Normal	31.9%	18.2%	21.2%	15.8%
Blood Pressure on Admission	200/123	192/126	197/123	193/128

TABLE V

Effects of Bilateral Celiac Ganglionectomy in Cases of Malignant and Non-Malignant Hypertension

	No. of Cases	*Adm.*	*Disch.*	*Dif.*	*1–3 Mos. P. O.*	*Dif.*	*4–6 Mos. P. O.*	*Dif.*	*7–12 Mos. P. O.*	*Dif.*
Malignant Hypertension	16	234/148	185/119	–49/29	198/129	–37/20	204/123	–25/24	207/131	–24/15
Non-Malignant Hypertension	16	221/133	170/107	–51/26	182/113	–37/18	185/118	–31/14	192/123	–29/16

TABLE VI

Comparison Between the Results of Celiac Ganglionectomy in 15 Cases in Which the Blood Pressure Rose with Those in 15 Cases in Which the Blood Pressure Fell During a Period of Rest in the Hospital

	Adm.	*After Period of Rest*	*Disch.*	*Dif.*	*1–3 Mos. P. O.*	*Dif.*	*4–6 Mos. P. O.*	*Dif.*	*7–12 Mos. P. O.*	*Dif.*
Rise in Blood Pr. Before Op.	224/129	226/145	172/110	–52/19	192/112	–27/14	194/114	–34/14	175/107	–27/20
Fall in Blood Pr. Before Op.	217/137	181/111	172/116	–45/21	183/119	–34/18	188/118	–26/24	184/124	–32/22

As far as symptomatic relief is concerned, celiac ganglionectomy may be considered a satisfactory method for the treatment of essential hypertension.

Effects of Celiac Ganglionectomy on Blood Pressure

The effects of bilateral celiac ganglionectomy on the blood pressure are given in Tables I to IV. The results were better than from any other of the procedures which had previously been employed by us. The marked fall in the systolic and diastolic pressures as shown in Tables II and III is especially significant.

Of special significance are the figures given in Table IV which show a reduction of the blood pressure to a completely normal status in 27.5 per cent of the patients on discharge from the hospital, in 18.2 per cent in the 1 to 3, and in the 4 to 6 month postoperative periods, and in 15.8 per cent in the 7 to 12 month period.

A comparison of the effects of celiac ganglionectomy on the blood pressure in cases of hypertension in the malignant and in the non-malignant phase indicates clearly that, even in cases of advanced malignant hypertension, the operation is not contraindicated (Table V, Fig. 1).

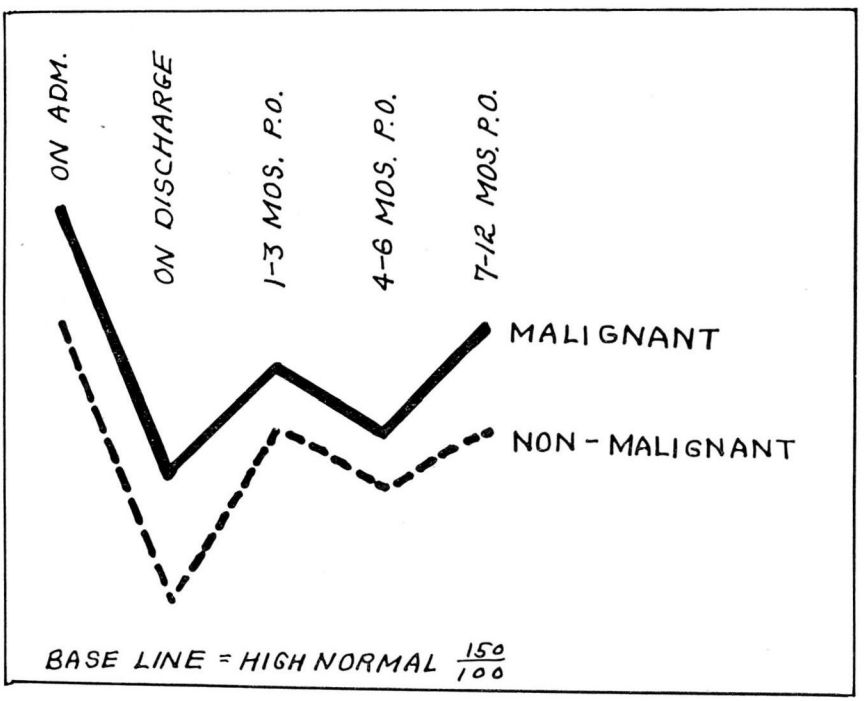

Figure 1: Effects of bilateral celiac ganglionectomy in cases of malignant and non-malignant hypertension.

In order to see whether or not patients in whom the blood pressure rose during a period of rest in the hospital were worse risks than those in whom the blood pressure fell during the preoperative period, a comparison has been made between the end results in 15 consecutive

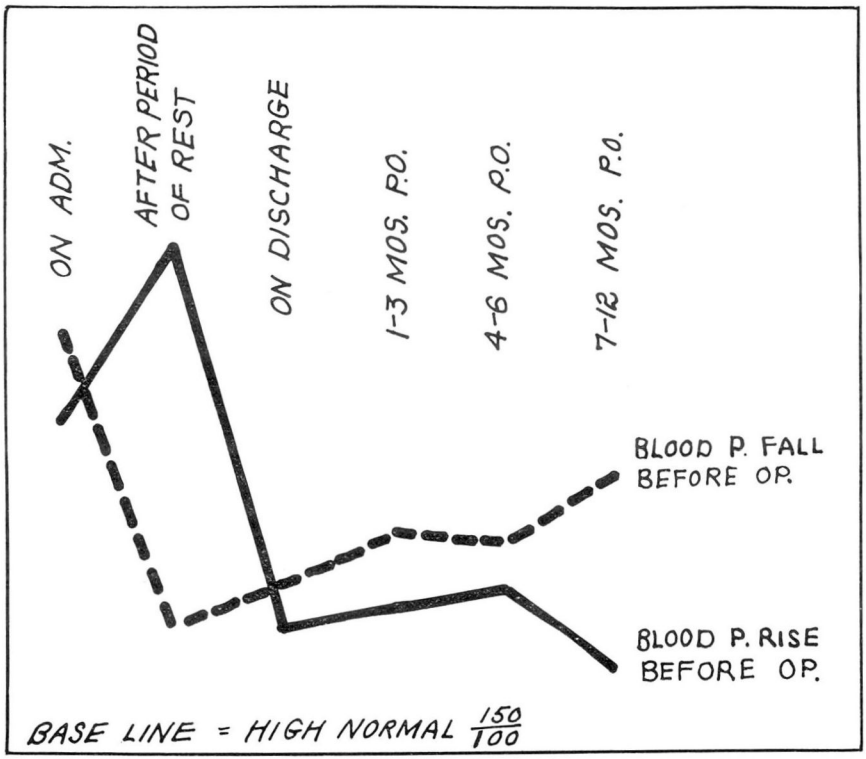

FIGURE 2: Effects of periods of rest in the hospital on the results of bilateral celiac ganglionectomy.

cases in which there was either a rise or no change in the pressure during the preoperative period, and the end results in 15 cases in which the blood pressure fell before operation. Table VI shows that there is no significant difference between the results in these two groups of cases (Fig. 2).

An interesting observation is that of this total group of 30 patients six died at varying periods after they left the hospital, and that in three of these six cases the blood pressure had decreased during the preoperative period.

OPERABILITY

Our analysis of the follow-up data has shown that neither the age of the patient, nor the duration of the disease, nor the condition of the heart, nor the finding that the disease has entered the malignant phase, nor the

effects of sedation is a contraindication to celiac ganglionectomy. In our last series of 112 cases of celiac ganglionectomies there has been no death from apoplexy, and no death from heart failure. We have thought that the only contraindication for the operation was impaired kidney function. The early results in two cases in which glomerulonephritis was associated with essential hypertension, however, lead us to believe that even this criterion may be negated.

While it is too early to make any final judgment regarding the true end results of celiac ganglionectomy, the almost complete symptomatic relief, the improvement in blood pressure in the first year after the operation, and the fact that many patients are able to return to their usual occupation make it appear that the operation of bilateral celiac ganglionectomy is well worth while.