FURTHER EXPERIENCE OF THE CARDIAC
SIGN IN CANCER.By WILLIAM GORDON, M.D.CAMB., F.R.C.P.LOND.,
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SOME nine years ago¹ I drew attention to a cardiac sign in cancer which seemed to possess some diagnostic value, and over four years ago² I published evidence that this value existed. I now desire to bring forward further evidence corroborating the former, and, from fuller experience, to define more closely the extent of the value and its limitations. May I remark that our means of diagnosing cancer, even in its later stages, are not always so perfect as to make any help superfluous?

The cardiac sign in cancer consists of a remarkable diminution of the cardiac dullness in the recumbent posture as determined by digital percussion. In that posture the dullness, in the normal adult, begins above about the third costal cartilage, reaches rightwards as nearly as possible to the mid-sternal line, and measures across about 3 to 3½ in. at the level of the fifth costal cartilage. On the other hand, in the cancer patient who presents the sign the cardiac dullness in recumbency begins above about the fourth or fifth costal cartilage, has its right margin ½ in. or 1 in. to the left of the mid-sternal line, and measures across less than 2 in. at the level of the fifth costal cartilage. Often it measures less than 1 in. across. Sometimes there is no cardiac dullness at all.

Digital percussion is a good deal dependent on personal factors. The measurements I am here quoting refer to my own observations. Others may find somewhat different limits. The percussion I use is moderately light.

The sign may be explained in three different ways:

1. In some cases of cancer the heart is small, and this reduction in size has been said to account for the reduction of the dullness. It may sometimes partly explain it; but by no means always; for often the dullness, though very small in the recumbent position, is normally or even abnormally broad in the erect.

2. If the loss of elasticity, so common in the skin in cases of cancer, affects the lung as well, it is conceivable that ordinary respiration may induce a sort of spurious emphysema and thus diminish the dullness. It is now known that a peculiar form of emphysema does often occur in cancer—Fenwick found it in 28 per cent. of his cases of gastric cancer³—and no doubt in many cases this helps to produce the sign.

3. The cardiac sign is often associated with a remarkably soft and toneless pulse, and with very feeble heart sounds. If we suppose that the first is due to a deficiency of blood—such as the anaemia so often present suggests—and that the second shows a flabbiness of the heart muscle comparable to the flabbiness of the skeletal muscles so often recognizable in such patients, it is not difficult to imagine a flabby and imperfectly filled heart dropping back from the anterior chest wall on recumbency more than a normal heart would do. And this is just what actually seems to occur. For the disparity between the heart dullness in the erect and recumbent positions in cancer is usually much greater than that observed either in health or in other diseases. I have found, for instance, a heart dullness in a case of cancer, measuring 5 in. across in the erect position, drop to 1½ in. across when the recumbent posture was assumed. Indeed, in cases where an enlarged heart prevents the appearance of the cardiac sign as I have defined it, I have thought that such an exceptional disparity in the erect and recumbent dullnesses, or an exceptional withdrawal leftwards of the rightward edge of dullness on assuming the recumbent position, had almost the same meaning as the cardiac sign itself. That, however, requires further investigation.

But it is necessary to bear in mind certain obvious limitations of the sign's significance. Thus, when any cause is present tending, like common emphysema, to reduce the heart's dullness, then a very small cardiac dullness has naturally no special meaning. Also where, in a case of suspected cancer, some well known cause of enlarged cardiac dullness is present, such as albuminuria, valvular heart disease or retraction of lung from phthisis or former pleurisy, then the absence of the cardiac sign is, of course, of no significance.

To these obvious limitations I would add two others, from experience, less obvious and yet easily understood. Where the heart is considerably displaced upwards by abdominal distension, I have found the sign unreliable. Here clearly the organ is pushed from a wider into a narrower space, where it cannot so easily drop away on recumbency from the anterior chest wall. Again, where a large oesophageal cancer has lain just behind the heart the sign has been absent, and I have thought that this might be explained by the growth pinning the organ forward against the sternum and rib cartilages.

TABLE I.—Thirty-six Cancer Cases in which all other Causes
tending to Reduce the Cardiac Dullness were Absent.

Seat of Disease.	Age.	Loss of Weight, etc.	Cardiac Dullness.	
			Width.	Upper Level.
			Inches.	Rib.
Stomach ...	46	Late. 1 stone lost; trace of albumen	Almo	st none
Stomach ...	64	Late. Died soon; 30 lb. lost	2	—
Stomach ...	66	Late. Died soon	2	—
Stomach ...	60	Late. Tumour	2	5th
Stomach ...	38	Early. Operation; removed; microsc.	1	5th
Caecum ...	50	Late. Emaciated; gland microsc.	1	—
Rectum ...	55	Late. Extremely thin; palpable	1	4th
Prostate ...	49	Late. Ulcer into rectum	1	5th
Stomach ...	54	Late. Operation; microscop.	1½	4th
Stomach ...	45	Late. Tumour; 2 stone lost	1½	4th
Stomach ...	66	Glycosuria. Died 8 months later of cancer of liver	1½	5th
Pharynx ...	54	Large fixed glands in neck. Iodide useless	1½	4th
Liver ...	45	Late. Trace of albumen	1½	4th
Colon ...	62	Late. Died a month after leaving hospital	1½	4th
Stomach ...	47	Late. Tumour	1½	4th
Sigmoid ...	42	Late. Mass palpable; 2½ stone lost	1½	4th
Cervix uteri ...	50	Not quite fixed	1½	4th
Recurrence in brachial plexus "Abdominal" ...	64	After removal of glands in axilla	1½	5th
	48	Late. Node microsc.	1½	4th
Rectum ...	62	Early. Someloss of flesh; operation; removed	1½	4th
Oesophagus ...	56	Late. P.M.	1½	4th
Pancreas ...	70	Late. P.M.	1½	4th
Stomach ...	66	Late. Died "evidently from cancer"	1½	4th
Stomach ...	64	Late. Tumour	1½	—
Stomach ...	70	Late. Tumour	Under 2	—
Caecum ...	68	Late. Died; tumour and large fixed glands	Under 2	—
Oesophagus ...	68	Late. Died	Under 2	—
"Abdominal" ...	77	Late. Died; doctor sure it was cancer	Under 2	—
"Abdominal" ...	70	Late. Also cancer of breast	Under 2	—
Skin of neck ...	73	Late. After removal of tongue	Under 2	—
EXCEPTIONS.				
Stomach ...	44	7 months' duration. Lost 3½ stone; advised exploration; died 8 months later of perforation; operation	3½	3rd
Ovary ...	47	3 months' pain. No loss of flesh; healthy appearance; advised exploration; operation; removed	3½	3rd
Rectum ...	56	Late. Fixed; considerable wasting	3½	3rd
Transverse colon	50	1 month symptoms. No loss of flesh; healthy appearance; diagnosed cancer; operation; too adherent to remove	3	3rd
Stomach ...	60	Late. Tumours, apparently in stomach and liver; loss of flesh; no free HCl	2	4th
Stomach ...	56	Late. Large tumour, apparently gastric; loss of flesh 1 stone	2	4th

Yet, allowing for all these limitations to its employment, there remains a very large number of cases in which its usefulness or uselessness can be tested. In the accompanying lists it should be understood that all sources of error from any of the causes I have mentioned have been carefully excluded.

What, then, is its precise value?

In 1908, from a study of 103 cases,² into all of which a suspicion of cancer had entered, I obtained the following figures: Of 38 cases in which a presumable cancer was naturally accessible to direct observation or was examined at operation or *post mortem*, 89 per cent. showed the cardiac sign. Of 19 cases which ended fatally in accordance with a diagnosis of cancer, nearly 90 per cent. showed it. Of 46 cases, on the other hand, which could not be supposed to have been cancerous, it was only found present in 24 per cent.

My further experience bears out this contrast. During the last four years I have collected 107 cases, either cancerous, simulating cancer, or accompanied by loss of flesh. They indicate that whereas in cancer the sign is present in an overwhelming majority, in non-cancerous cases it is even rarer than my former figures suggested.

Thus, of 36 cases which appear undoubtedly to have been cancerous, 83 per cent. showed the sign (Table I), whereas of 71 cases which cannot be supposed to have been cancerous, only 8 per cent. showed it (Tables II and III).

Putting together this series and that of 1908, we obtain 33 cancerous cases showing the sign in nearly 87 per cent., and 117 non-cancerous cases showing it in only 14 per cent.; or, considering the results in another way, of

TABLE II.—Twenty-eight Cases of Pronounced Non-cancerous Wasting, in which Heart, Lungs, and Kidneys were Healthy.

Disease.	Age.	Loss of Weight, etc.	Cardiac Dullness.	
			Width.	Upper Level.
			Inches.	Rib.
Addison's disease	43	3 stone	Increased.	
Leucocythaemia	43	6 stone	5½	3rd
Diabetes ...	63	"Much loss"	4	3rd
Diabetes ...	58	"Much loss"	4	3rd
Hysterical polyuria	54	Over 3 stone. Better 6 months later	4	3rd
Gall stones	49	½ stone. Well 2 years later	4	3rd
Diabetes ...	35	3 stone	3½	3rd
Diabetes ...	21	1 stone	3½	3rd
Diabetes ...	20	2 stone	3½	3rd
Diabetes ...	33	4 stone	3½	3rd
Diabetes ...	32	"Emaciated"	3½	3rd
Tuberculous glands	34	"Considerable loss." Operation; micros.	3½	3rd
Gastritis ...	62	3 stone. Well 6 months later	3½	3rd
Psoas abscess	53	"Great loss"	3½	3rd
Diabetes ...	74	"Great loss"	3½	3rd
Addison's disease	21	"2 or 3 stone." No question of cancer	3½	3rd
Gastritis ...	20	Probably 1 stone	3½	3rd
Gastritis ...	34	"Very much loss." Operation; no cancer	3	3rd
Tuberculous peritonitis	16	"Much loss"	3	3rd
Tuberculous peritonitis	17	"Much loss"	3	3rd
Diabetes ...	30	"Considerable loss"	3	3rd
Diabetes ...	35	2 stone	2½	3rd
Gastric ulcer	37	Emaciated; perforated; operation; no cancer	2½	4th
Gastric ulcer	27	"Great loss"	2½	3rd
Psoas abscess	22	2½ stone	2½	3rd
Febrile enteritis	42	Great loss. Recovered.	2	4th
EXCEPTIONS.				
Gastritis ...	55	2 stone. Much better 6 months later	Under 2	—
Gastritis ...	69	"Many pounds loss." Better 3 years later	Absent.	—

TABLE III.—Forty-three Non-cancerous Cases, either with Wasting or with Suspicion of Cancer, in which Heart and Lungs were Healthy and Bright's Disease absent.

Disease.	Age.	Loss of Weight, etc.	Cardiac Dullness.	
			Width.	Upper Level.
			Inches.	Rib.
Mucous colitis ...	63	Well 3 years later	4	—
Ovarian tumour...	47	Operation. No cancer	4	3rd
Gall stones ...	49	Lost 20 lb. Much better 2 years after	4	3rd
Gastritis ...	53	Well 3½ years after	4	3rd
Hæmatemesis ...	56	Well 1 year after	4	3rd
Operation for piles	37	No cancer	4	3rd
Abscess left kidney	43	Urine normal. Operation	4	2nd
Gastritis ...	36	Lost a good deal of weight. Well 18 months after	3½	3rd
Gastritis ...	48	His doctor suspected cancer. Well 1 year after	3½	3rd
Gastritis ...	29	Lost a good deal of weight. No cancer	3½	3rd
Tuberculous kidney	28	Urine normal after removal. Great wasting	3½	3rd
Gastric ulcer ...	41	Much better 2 years after	3½	3rd
Mucous colitis ...	39	Lost ½ stone. Well 5 months after	3½	3rd
Gastritis ...	62	Lost 3 stone. Well 6 months after	3½	3rd
Abscess of thigh...	66	Lost some pounds	3½	3rd
Miscarriage ...	25	"Much thinner"	3½	3rd
Hydronephrosis...	65	—	3½	3rd
Splenomegaly ...	43	No suspicion of cancer. Improved	3½	3rd
Gall stones ...	55	Operation. No cancer	3	3rd
Appendicitis ...	60	Lost much weight. Operation; no cancer	3	3rd
Neurasthenia ...	55	Lost much weight. Well 1 year after	3	3rd
Gastritis...	37	Had lost weight. Greatly improved	3	3rd
Hysteria ...	42	Extremely thin. Greatly improved	3	4th
Ovarian tumour	30	Loss of weight. Operation	3	3rd
Gastritis ...	37	—	3	3rd
Tuberculous bladder	30	Bright's disease absent	3	3rd
Goitre ...	43	Had lost weight. No evidence of cancer	3	3rd
Gastritis ...	48	Very thin. Well 1 year after	Normal	
Abdominal adhesions	65	Operation. No cancer	Normal	
Duodenal ulcer ...	60	Lost much weight. Operation; no cancer	Normal	
Thyroid tumour	56	Hard, nodular, adherent. Well 3 years after	Broad	
Abscess in pelvis	53	Question of sarcoma. None found	Normal	
Gastritis ...	63	Family history of cancer. Well 3 years after	Normal	
Gall stones	60	Well 1 year after	Normal	
Neurasthenia ...	47	Well 1 year after	Normal	
Dysphagia ...	34	Well 3 years after	Normal	
Gastritis ...	38	Very thin. Well 4 years after	Normal	
Gastritis ...	56	Losing weight. Well 2 years after	2½	3rd
Gastritis ...	31	Stomach dilated. Well 4 years after	2½	—
EXCEPTIONS.				
Gastritis ...	52	Advised exploration. Well 3½ years after	1	4th
Dilated stomach	47	Better 2 years after	½	5th
Gastritis ...	44	Lost ½ st. in 2 months. Better 4 years after	½	—
Dysphagia...	64	? Cause. Now has jaundice, but no proof of cancer	Absent	

98 cases showing the cardiac sign 82 per cent. were cancerous, and of 112 cases not showing this sign 88 per cent. were non-cancerous.

To be entirely fair, however, only such cases should be compared with the cancerous as themselves were open to a possibility of malignancy like those dealt with in 1908. Amongst those enumerated in Tables II and III, I think 37 cases may be so regarded, as may also the 6 exceptions.

Here, therefore, we have a series comparable to that which I published in 1908. They give a percentage of only 14 showing the cardiac sign. Adding the two series (of 1908 and 1912) together, we obtain 89 cases non-cancerous but more or less open to the suspicion of being cancerous, with only 19 per cent. showing the sign, a striking contrast to the actually cancerous cases; and of 88 cases which did not show the sign 85 per cent. were non-cancerous.

So that in a suspected case of cancer the presence of this sign adds considerably to the likelihood of the presence of cancer and its absence to the likelihood of the absence of cancer, except, I should add, in early cases.

But it has been objected by an able observer that the sign is only corroborative of considerable wasting. If this were correct, the sign would only be a curiosity. The following facts show that his suggestion is mistaken.

In non-cancerous wasting, even when extreme, it is rarely present (Table II).

In cancerous wasting, even when marked, it is occasionally absent (Table I).

In cases of cancer which have not wasted at all, it is sometimes present (Table I).

Indeed, it is not apparently even true that the diminution of the dullness in cancer is proportional to the wasting (see Table IV).

TABLE IV.—Cancer Cases in which the Amount of Wasting is indicated distinctly (in TABLE I).

Amount of Wasting.	Cardiac Dullness.		Amount of Wasting.	Cardiac Dullness.	
	Width.	Upper Level.		Width.	Upper Level.
None	Inches. 3½	Rib. 3rd	2½ stone ...	Inches. 2	—
None	3	3rd	2½ stone ...	1½	4th
1 stone... ..	Almost none	—	3½ stone ...	3½	3rd
1 stone... ..	2	—	"Extremely thin"	1	4th
2 stone... ..	1½	4th	"Emaciated"	1	—

One very important question—the value of the sign in operable cases—I cannot settle because so few operable cases, satisfying the conditions I have laid down, have presented themselves. But it is worth mentioning that of 6 operable cases 4 gave the sign.

Another important question—how often the sign may lead one into error—can be reasonably answered. If ordinary care be taken and the frequency of its occurrence in cancer and of its non-occurrence in other cases be remembered it should rarely mislead. In the cancer cases which were operable it caused no mistake. In non-cancerous cases it has, perhaps, induced me to suggest exploration unduly often—a pardonable error—and in several to hazard an erroneous forecast. On the other hand, had I paid more heed to it, I should have saved myself more than once from mistake.

In sarcoma I have noticed that the sign seems less commonly present.

With regard to some of the earlier cases it is instructive to recall the opinions of others—all men well qualified to form a sound judgement, but without the advantage of experience of the sign.

Caecum.—Diagnosed five weeks before a distinguished surgeon would accept the opinion and operate. After operation the growth recurred.

Sigmoid.—A well-known surgeon declined to admit that a diagnosis was possible; it had been made, however, and on operation a cancer was found and removed. It has not recurred during five years.

Stomach.—An able surgeon declined to accept the diagnosis and to operate. He operated, however, several months later. Cancer was found (microscopied).

A friend of mine, who habitually looks for the sign, has had a similar experience to these. He sent an early uterine cancer to a well-known specialist. The specialist declined to operate, because he considered the case was not cancerous. In fact, I believe he treated my friend with some contumely. Later on, when the case was inoperable, he apologized.

In conclusion, I would sum up thus the results of my experience:

1. The sign is of practical value.
2. If present in a case where the presence of cancer is possible, the diagnosis of cancer should only be rejected after most careful consideration.
3. If absent in what may be an early case of cancer, little stress must be laid on its absence.
4. But if absent in what must be, if cancer at all, a late case of it, its absence strengthens considerably the likelihood of the absence of the disease.

REFERENCES.

- ¹ *Transactions of the Royal Medical and Chirurgical Society*, March, 1904. ² *BRITISH MEDICAL JOURNAL*, 1908, vol. ii, p. 298. ³ Fenwick, *Cancer and Tumours of the Stomach*, 1902, p. 74.

LIPODYSTROPHIA PROGRESSIVA.*

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I WOULD define lipodystrophia progressiva (*λίπος* = fat, *δυσ* = bad, *τροφή* = nourishment), a term for which we are indebted to Dr. A. Simons¹ of Berlin, as a morbid condition, possibly confined to the female sex, and characterized by progressive disappearance of the subcutaneous fat from the face, upper extremities, and trunk, whereas the fat of the lower extremities and gluteal regions remains unaffected or is increased in amount. In some cases, perhaps, the condition is one of pathologically altered distribution of fat rather than of genuine wasting, or possibly merely of relative excess of fat in the lower extremities and buttocks of an otherwise rather thin subject. Although I have retained the adjective "progressiva" as suggested by Simons, it is by no means certain that the disorder is always a progressive one. In all probability all degrees of this abnormal fat distribution occur, progressive in some subjects, and arrested or stationary in others, whilst in yet other cases the condition may probably occur as only a temporary feature in the life-history of a patient or as little more than a slight exaggeration of a normal female sex character. In this connexion it must of course be remembered that the development of subcutaneous fat is greater in the thighs and gluteal regions of the average human female than of the average male. This local distribution of subcutaneous fat constitutes practically a secondary sex character, and the gluteal prominence is greatly exaggerated in some African races, constituting the racial peculiarity known as "steatopygia," which is illustrated by the pictures of the "Hottentot Venus."† In regard to the occasional exaggeration of this sex character in Europeans I would quote a remark made by Pierre Marie at the discussion of a case at the Société de Neurologie, at Paris, July 11th, 1912—namely, that it is not rare to meet with women the upper part of whose bodies is emaciated in comparison to the fatness of their lower limbs. A curious fact is that in some pathological conditions, notably in the case of a young woman shown by Dr. H. G. Turney at the Royal Society of Medicine on March 5th, 1913, as probably an example of "a pituitary and adrenal syndrome," this sexual predominance of subcutaneous fat about the thighs and gluteal regions is altogether wanting, though there may be an apparently excessive accumulation of subcutaneous fat in the face and trunk.

In June, 1911, I saw a young unmarried woman, aged 27, of Jewish parentage, who had lost almost all the subcutaneous fat from her body, but less from the parts below the iliac crests and groins—that is to say, from the buttocks, thighs, and legs—than from the trunk, face, and upper extremities; moreover, there was no extreme loss of fat from the orbits or mammae. I found no evidence of any visceral disease. There was a report of temporary glycosuria about one year previously,‡ which I

* A paper read at the Neurological Section of the Royal Society of Medicine on May 22nd, 1913.

† In regard to the racial distribution of "steatopygia," see S. G. Shattock, *On Normal Tumour-like Formations of Fat in Man and the Lower Animals*, *Proceedings of the Royal Society of Medicine, Pathological Section*, London, 1909, pp. 209-226.

‡ Transient glycosuria is, I believe, not rarely to be found in young persons with various disorders of general nutrition and development. I have noted it myself in an undeveloped girl of the "mitral infantilism" class, and in a young woman with a moderate degree of infantilism of the "ateleiosis" class. I showed both these cases at the Royal Society of Medicine in the first half of 1913.