

## Melanoma Metastases in Myocardium: Historical Highlights

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### Abstract

The medical masters of yester years believed that nature throws light on the basic characteristics of cancer metastasis. In particular, owing to its coloration, melanoma takes pride of place in revealing such natural footsteps. On this account, this paper deals with the patterns derivable from a study of cases in which there was documentation of localization of the deposits of melanoma in the pumping mechanism, i.e. the heart itself. Their highlights are worthy of historical documentation, especially as a recent historical review did not include them.

**Keywords:** *Melanoma; Metastasis; Heart; Localization; History*

### Introduction

Elsewhere [1], I documented the views of the medical masters of yester years concerning how Nature helps in tracing her footsteps during metastasis. According to Merriam-Webster's Collegiate Dictionary [2], melanoma came into use in 1838; it defined it as a tumor which forms pigments characteristically. Therefore, this paper traces such colored deposits in the most mobile of all the bodily organs, namely, the heart itself. Incidentally, a 1889 historical review did not cover it [3].

### Historical texts

An anonymous contributor [4] was at pains to delineate that "The Pathological Society of London is instituted for the cultivation and promotion of Pathology, by the exhibition and description of Specimens, Drawings, Microscopic Preparations, Casts, or Models, of Morbid Parts." Accordingly, I have seized the opportunity of surveying my available copies of their Transactions. Some autopsy accounts did not mention the heart at all [5,6]. Incidentally, the state of the heart was not mentioned because only the head was opened [7]. In other cases, there was mere listing of the heart among the organs colonized [8,9].

The earliest report in the Transactions by Smith [10] was brief as follows:

On looking at the heart, a black mass, about the size of a chestnut, was seen in the substance of the left ventricle. Several small tumours, the size of pears, were scattered about in the vicinity of the larger one.

On his part, Godlee [11] described sharply that "The heart contained two tumours in the centre of two columnae carneaee". Also snappy was Bryant [12] who noted that "The heart had on its front surface, and embedded in the walls of the right ventricle, a tumour the size of a marble".

Moderate descriptions appeared from Sanderson [6] as follows:

In the cavity of the left ventricle, near its apex, there is a cancerous tumour, as large as a pea, attached to one of the fleshy columns by a pedicle. On the surface of the right ventricle, near its base, there is a somewhat larger mass subjacent to the pericardium. A similar tumour, not so large, was found on the surface of the left ventricle.

On first admitting that patients died from malignancy in “such an unusual position as the heart”, Beadles [13] described that organ’s colonies thus:

Springing from the posterior wall of the right auricle immediately above the flap of the tricuspid valve and bulging into the auricular cavity was a tumour as large as a hen’s egg. Its surface was smooth and shining and covered by the endocardial lining, there being no sign of ulceration. The surface was bossy, and there were a couple of small outgrowths connected to the mass only by thin stalks. On section it was firm and of a whitish colour. Another growth rather larger than the little finger-nail was situated above the opening into the right auricular appendix. These growths did not appear on the outer side of the auricle, but there was another small growth beneath the pericardial covering. In the wall of the left ventricle near the apex was a deposit of oval shape the size of an almond, and several smaller ones close by in the muscle tissue. There were also some small deposits the size of peas or less embedded in the wall of the right ventricle.

Ogle [14] chose a two-fold approach. Firstly, he began with the heart in supplying a long list of involved organs found at postmortem. Secondly, he mused as follows:

As regards the heart, both the pericardium and endocardium, and the substance of the walls, were the seat of deposit, though it was rare in the latter part.

Both Calvert and Pigg [15] also began by listing the heart first and then supplying details thus:

A few nodules projected from the walls of the auricles, and many from the ventricles, especially near the auriculo-ventricular groove, where some of them were as large as walnuts. Many nodules were seen buried in the muscular substance of the ventricles, and others bulged beneath the endocardium into their cavities. The valves were natural. All the growths in the heart were deeply pigmented.

Legg [16] showed not only pericardial, but also auricular and ventricular growths. Let them be excerpted as follows:

The pericardium shows many new growths, both outside and inside; the surface covering the left ventricle shows these nodules most abundantly; there are but few on the right side. One of the pericardial new growths is distinctly pedunculated. Within the right auricle, close to the foramen ovale and attached to the septum, is a pedunculated white tumour, the size of a marble. There is a smaller tumour also attached to the septum, sessile. There are a few small tumours in the wall of the right ventricle, close to the attachment of the tricuspid valve, at the apex of the ventricle and in the conus arteriosus. There is none in the left auricle; there are but few in the left ventricle, and these not bigger than pins’ heads, and pigmented.

Towards the end of the Century, Mackenzie [17] was almost encyclopedic thus:

Heart weight, 9½ oz. There is a firm, greyish-black nodule about the size of a flattened bean, and a few of smaller size on the outer anterior surface of the right ventricle, and a few pin-head specks on the other surfaces. All the cavities contain partially decolourised clots, the aortic valve is incompetent, and the heart’s substance soft and flabby. Left side: There are a few calcareous concretions over the valve segments and commencement of the aorta, and a shiny one the size of a pea near the insertion of the anterior segment of the mitral. There is also considerable atheroma of these parts. There is a black, firm nodule the size of a pea on a papillary muscle, under the endocardium, and many smaller ones scattered throughout this cavity. There is a greyish-black nodule the size of a bean in the posterior wall of the left sinus venosus. Right side: In the cavity of the right ventricle, on its anterior surface, there is a black, firm nodule the size of a hazel-nut, and a few, from the size of pin-points to small shot, scattered throughout this cavity. The papillary muscles in their whole length are sprinkled with small black specks, but the valves are free. There is a focus of larger-sized and numerous smaller ones on the surface of the septal wall, opposite to, and probably when *in situ*, touching the larger mass on the anterior wall.

The surface of the cavity of the right auricle has here and there a black speck the size of a No. 5 shot. Besides these there are black specks embedded in the cardiac muscle.

### Discussion

The old authors were keen observers. In fact, the distinct coloration of the melanoma ensured their obtaining of excellent pictures of the myocardial metastases. Incidentally, they portrayed minute differences by pointing to the size variations implicit in such distinct terms as chestnut, marble, pea, hen's egg, little finger-nails, walnut, pin's heads, bean, hazel-nut, pin-points, and "black speck the size of a No. 6 shot." These imaginative details foretold the recent progress made in understanding the pathology of malignant melanoma [18].

Surely, there are the problems of inter-observer variation in the histopathological diagnosis of clinically suspicious melanoma lesions [19]. Of course, regarding the history of cancer in general [20], "Different people respond in different ways to history; to some it is past and finished with; to others mythical and open to disbelief; others consider it mythical and open to disbelief; yet others would have us study it in depth, believing that it holds some information for the future".

### Conclusion

I am persuaded that essential elements of the possible variations in this field have been provided here. Certainly, they are missing in the recent historical review dealing with pigment biology [21]. Also beyond the scope of this paper are the published esoteric molecular and genetic diversity in the metastatic process of melanoma [22].

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