



Letter to editor

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Proposed biology of the spontaneous remission of cancer (extensive tumor hypoxia)

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Case reports of the spontaneous remission or regression of cancer remains a mystery. A sudden disappearance of all signs and symptoms of cancer without any medical intervention. This paper addresses this issue.

An extensive review of the reported cases of the spontaneous remission or regression of cancer seem to indicate two events preceding the spontaneous remission or regression of cancer. A low blood oxygen and a rapid tumor growth. Spontaneous remissions or regressions of cancer may be preceded by pneumonia, pulmonary metastases, pulmonary edema, severe bleeding. All have in common a low blood oxygen. Possibly resulting in the tumor becoming further hypoxic. Rapid tumor growth prior to the spontaneous remissions or regression of cancer has been noted by some of authors of the reported cases of the spontaneous remission or regression of cancer (1,2). Rapid tumor growth in the presence of low blood oxygen may further induce hypoxia

A spontaneous remission or regression of Hepatocellular carcinoma may be preceded by hepatic artery embolism. The hepatic artery embolism may result in hepatic tumor becoming further hypoxia due to lack of blood supply to the hepatic tumor (3)

The following might be suggested as possible reasons for extensive tumor hypoxia:

- 1) Spontaneous remission of hepatic cellular carcinoma might be preceded by hepatic artery embolism reducing blood supply (oxygen) to the hepatic tumor (3).
- 2) Some of the reported cases of spontaneous remissions of cancer are preceded by pneumonia, pulmonary edema, pulmonary metastases all have in common low blood oxygen (1,2)
- 3) Spontaneous remissions of cancer may be preceded by severe bleeding possibly followed by low blood oxygen delivery due to low iron level (6,7).
- 4) Spontaneous remission of cancer may be preceded by biopsy particularly Merkel Cell Carcinoma. Biopsy might have resulted in a breakage of a blood vessel within a tumor resulting in internal bleeding within a growing tumor and the growing tumor becoming extensively hypoxic (4,5).

Discussion

Possibly The immune system may recognize the tumor with extensive hypoxia as a diseased tissue as it would have recognized normal tissue with extensive hypoxic as a disease tissue. The diseased tissue may possibly trigger the immune system to remove the diseased tissue (malignant growth) with the development of immunity and the remission of cancer.

Possibly extensive hypoxia in a growing malignant tumor disrupts tumor hemostasis making the malignant tumor vulnerable to an immune response and followed by development of immunity against the malignant growth. Hypoxia may occur within the tumor and within the tumor microenvironment.

Possibly extensive hypoxia in a tumor due to low blood oxygen may have diminished the ability of tumor cells to manipulate the tumor microenvironment to abrupt immune responses. Resulting in the tumor becoming vulnerable to an immune response.

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one may draw the conclusion that a remission of a cancer might be induced by depriving a growing malignant tumor within its microenvironment of oxygen thereby inducing extensive hypoxia in a growing tumor. The key point being the tumor growing rapidly in the presence of low blood oxygen to possibly induce further hypoxia.

It is noteworthy that in cancer patient's immune response are suppressed by a malignant tumor particularly by the tumor microenvironment. Immune responses are not suppressed by a single cancer cell. Therefore, if a single tumor in a cancer patient becomes dysfunctional or vulnerable to an immune response then a remission of cancer may possibly occur.

The suggestion is that if extensive hypoxia is induced in a malignant tumor covered by a basement membrane, then possibly a remission will follow with the development of immunity. Aggressively growing tumor may respond better.

This is a suggested mechanism of the spontaneous remission of cancer.

Extensive tumor hypoxia, within the tumor microenvironment might be induced by different means such as using a syringe to draw blood rapidly from a growing tumor; injecting a tumor directly with iron chelators compatible with the malignant tissue, blocking or cutting a main vein delivery blood to a tumor; injecting a tumor with anti-angiogenesis drugs to temporarily reduce blood delivery to a growing tumor; etc.

Concluding Remarks

The basic hypothesis presented is as follows. if the growth of a single tumor in a cancer patient is retarded due to low blood oxygen and at the same time the malignant tumor is not affecting a vital organ and is induced to grow rapidly by any means other than increasing the blood oxygen than it is suggested that the malignant tumor may grow briefly and followed by a remission with the development of immunity against the malignant growth.

A clear example of this phenomenon is the spontaneous remission of hepatocellular carcinoma (2). Hepatocellular carcinoma may spontaneously disappear after hepatic artery embolism. The hepatic artery embolism prevents blood delivery (oxygen) to the hepatic tumor. The hepatic tumor having extensive hypoxia and becoming dysfunctional and being removed by the immune system. Afterwards metastatic tumor disappearing, and it may be followed by a prolonged and complete remission of hepatocellular carcinoma (3).

The tumor microenvironment is the ecosystem that surrounds a tumor inside the body. The hypothesis is that if the tumor ecosystem and/or the tumor itself becomes extensively hypoxic it may lead to the spontaneous remission of cancer. This is supported by the observation that some of the reported cases of spontaneous remission of cancer of different types of cancer are preceded by a low blood oxygen.

Disclaimer

Always seek the advice of your physician or other qualified health care provider with any questions you may have regarding a medical condition. Never disregard professional medical advice or delay in seeking it because you have read this study. This is not intended to be a substitute for medical advice, diagnosis, or treatment in regard to any patient

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