



Shark cartilage: the Laetrile of the 1990s

BOTH LAETRILE and shark cartilage have been presented to the public as effective and nontoxic drugs for malignant disease. While Laetrile has faded into history (as have numerous other highly touted but completely ineffective unconventional cancer remedies),¹ shark cartilage is the current darling of the alternative medicine and health food scene. Although accurate numbers on the use of shark cartilage are not available, more than 80% of my own patients have asked me about it during the past several months.

What is the attraction of these unconventional treatments? Why do large numbers of intelligent and educated patients pay more than \$100 per month for a product deemed safe and effective on the basis of nothing more than completely uncritical personal testimonials?

WHY WORTHLESS THERAPIES HAVE APPEAL

The shark-cartilage phenomenon closely follows a general pattern observed with unconventional or alternative cancer therapies that have been accepted by a segment of society as reasonable and even appropriate.^{2,3}

Such therapy must be essentially nontoxic, in clear contrast with conventional or "establishment" treatment, which is often characterized as being mutilating (eg, surgery) or highly toxic (eg, radiation therapy or chemotherapy).

The treatment should be "natural," which is appealing to some persons attracted to the concept of the role of "natural immunity" in controlling malignant tumor growth. In addition, such a strategy is portrayed as contrasting with "toxic" chemotherapy or radiation treatment, which is suggested to impair this natural immunity.

Many patients with cancer feel a major loss of control in their lives, particularly over decisions regarding antineoplastic treatments. Fortunately, more oncologists are coming to understand the importance of patient input into treatment considerations. For example, we now recognize that women with breast cancer have the right to decide whether they wish to undergo a total mastectomy or a more limited surgery with local radiation as treatment of local disease.⁴

However, for many patients this heightened awareness of patient autonomy on the part of cancer specialists does not satisfy their fundamental need to control their own destiny. Patients who decide to take a medication on the sole basis of their subjective assessment of the risks vs benefits may increase their sense of emotional well-being by increasing control of their lives.

The diagnosis of cancer is extremely frightening, even though more than 50% of all cancer patients are ultimately cured. Heightening this overwhelming fear is the extraordinary complexity of the disease process. The news media is saturated with reports of new findings about the causes of cancer, from smoking to diet, from electromagnetic fields to new viruses, and from oncogenes to cancer susceptibility genes passed on to us by our parents. Not surprisingly, cancer patients and their families, in trying to cope with the diagnosis of cancer, desire a simple and easily understood explanation for why the cancer developed and how it can be eliminated.

EFFICACY OF SHARK CARTILAGE UNLIKELY

Shark cartilage fits into this emotional void extremely well. The proponents of shark cartilage state that sharks rarely get cancer. (I do not know if this

statement is true, but will accept it for the purposes of this discussion.) They then assume that since the largest part of sharks' bulk is cartilage, something in shark cartilage must account for the rarity of cancer in this animal. Therefore, the argument goes, if patients simply ingest an arbitrary quantity of this cartilage (which presumably has been ground up and made into pills), cancer will regress.

The explanation is simple and superficially appealing and offers hope that a nontoxic substance can eliminate cancer. Unfortunately, the claims for the benefits of shark cartilage are completely unsubstantiated by any objective data from controlled clinical trials. In addition, based on everything we currently know about the development and biology of cancer and about gastrointestinal physiology, it is extremely unlikely (to be very generous) that oral ingestion of this material could have any clinically meaningful effect on the natural history of established cancer.

It is unknown how much, if any, of the pill is actually absorbed. Any of its contents passing through the stomach (if not inactivated in this highly acidic environment) and absorbed by the intestinal mucosa will enter the liver, where further breakdown of any active ingredient will take place.

What remains from the pill must somehow reach the tumor (which often has an extremely limited blood supply), be taken up by the cancer cells, and subsequently either inactivate or kill the malignant cells. One of the major reasons conventional antineoplastic agents have had only limited success against most established solid tumors is that delivering active drug to the site of tumor growth is extremely difficult.

Finally, this process of stopping tumor cell growth must not interfere with vital normal cellular functions. There is absolutely no clinical evidence that any substance currently exists, or will ever exist, that possesses such remarkable specificity for malignancy that it can inactivate or kill cancer cells without affecting normal cells.

It is highly likely that an objective assessment of the claims of the benefits of shark cartilage will reveal that patients with documented tumor regressions were also receiving conventional antineoplastic therapies known to be effective, or that patients who "lived longer than expected" are examples of the well-recognized heterogeneous natural history of malignant disease. Some patients may "feel better, gain strength, and experience less fatigue" (according to one favorable report in a health-food magazine) after taking shark cartilage, just as prayer, meditation, and group therapy may provide important emotional support for some persons dealing with an extremely difficult disease. However, improvement in emotional well-being, no matter how important this may be, is not the same thing as shrinkage of tumor.

Shark cartilage, like Laetrile,⁵ high doses of vitamin C,⁶ and coffee enemas⁷ before it, appears to provide many patients with hope and emotional support, but does nothing to the cancer. If history is any guide, after shark cartilage has fallen from favor, another "nontoxic, natural and highly effective cancer therapy" will replace it.

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REFERENCES

1. Dorr RT, Paxinos J. The current status of Laetrile. *Ann Intern Med* 1978; 89:389-397.
2. Cassileth BR, Lusk EJ, Strouse TB, Bodenheimer BJ. Contemporary unorthodox treatments in cancer medicine. A study of patients, treatments, and practitioners. *Ann Intern Med* 1984; 101:105-112.
3. Cassileth BR. The social implications of questionable cancer therapies. *Cancer* 1989; 63:1247-1250.
4. Harris JR, Lippman ME, Veronesi U, Willett W. Breast cancer (second of three parts). *N Engl J Med* 1992; 327:390-398.
5. Moertel CG, Fleming TR, Rubin J, et al. A clinical trial of amygdalin (Laetrile) in the treatment of human cancer. *N Engl J Med* 1982; 306:201-206.
6. Creagan ET, Moertel CG, O'Fallon JR, et al. Failure of high-dose vitamin C (ascorbic acid) therapy to benefit patients with advanced cancer. A controlled trial. *N Engl J Med* 1979; 301:687-690.
7. Green S. A critique of the rationale for cancer treatment with coffee enemas and diet. *JAMA* 1992; 268:3224-3227.