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Mini Review

A Note on Naturally Occurring Transmissible Cancers

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Abstract

The present paper deals with the study of a kind of new cancer recently investigated in animals as naturally occurring transmissible cancer. These cancers are transmitted with the help of cancer cells itself without the involvement of any causal organism.

Keywords: *Naturally Occurring Transmissible Cancers; CTVT; DFTD; Tasmanian Devils; Dogs; Mollusk Bivalves Neoplasia*

Introduction

Although, the microbial origin of cancer has already been documented unfortunately has never been seriously considered separately as a transmissible disease. Now, this is quite known to us that some of these microbial-origin of cancers are transmissible [1-4]. Surprisingly, in the recent past still, a new type of cancer has also been observed. They are developed and transmitted naturally without the involvement of any infectious agent. This is found in animals but is very rare in humans [5]. These naturally occurring transmissible cancers are spread via the transfer of living cancer cells. And, this is only possible by evolving the ability to infect another individual through the direct transfer of cancer cells with the highest adaptive potential. Only three transmissible cancers of the same nature have so far been reported [6]. They are as under:

1. A canine transmissible venereal tumour (CTVT)
2. Devil's facial tumour disease (DFTD)
3. Marine mollusk bivalves neoplasia [7].

For thousands of years worldwide in occurrence, canine transmissible venereal tumour (CTVT) is a sexually transmitted cancer [8]. Novinsky proved the fact that cancer cells are transferred mostly in sexually active dogs during mating [9]. The contagious tumours are developed in dogs around the genital organs, nose and mouth. Sometimes, these cancer cells are also transferred via the act of sniffing and licking [10]. Experimental studies have shown three distinct growth phases of CTVT cancer *viz.* (1) a progressive phase (2) a static phase and (3) a regressive phase [11]. This is rarely metastasized and not fatal responding well to the treatment with vincristine (Figure 1 and 2) [12].

Figure 1: *Canine transmissible venereal tumour (CTVT) in a male dog (Photo adapted from Dr. Rajesh Singh and Santosh Giri, Pashudhan).*

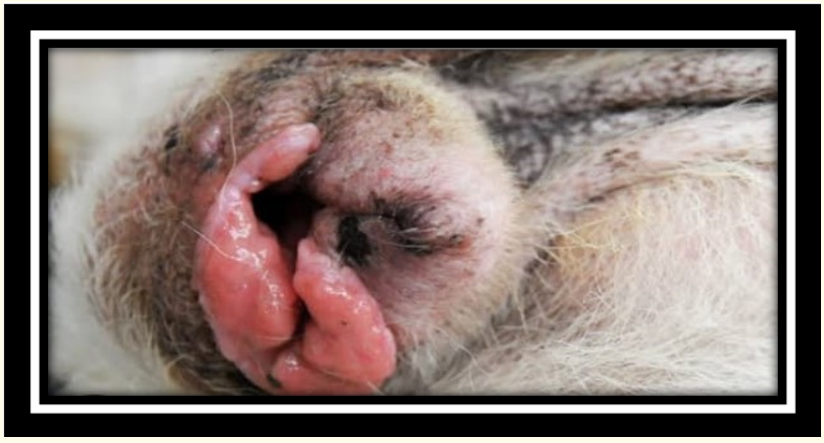

Figure 2: *Canine transmissible venereal tumor (CTVT) in a female dog (Photo adapted from K9Aid/CTVT Tumors).*

Similarly, another naturally occurring transmissible cancer found in nature is Tasmanian devil's facial tumor disease (DFTD) killing the host with extinction. Tasmanian devil (*Sarcophilus harrisii*) is a marsupial native to Australia. The disease was first observed in 1996 in northeastern Tasmania in Tasmanian devils [13]. DFTD is aggressive cancer developed as large ulcerative tumors around the face and jaws with absolute lethality. This is often transmitted via biting the devils each other (Figure 3) [14-16].

Lastly, two types of marine mollusk bivalves neoplasia have also been reported as disseminated and gonadal neoplasia of unknown origin. The disseminated neoplasia involves the excessive proliferation of neoplastic cells being transmitted via hemolymph often causing the death of an individual. Similarly, gonadal neoplasia is also observed in clams and mussels [17,18].

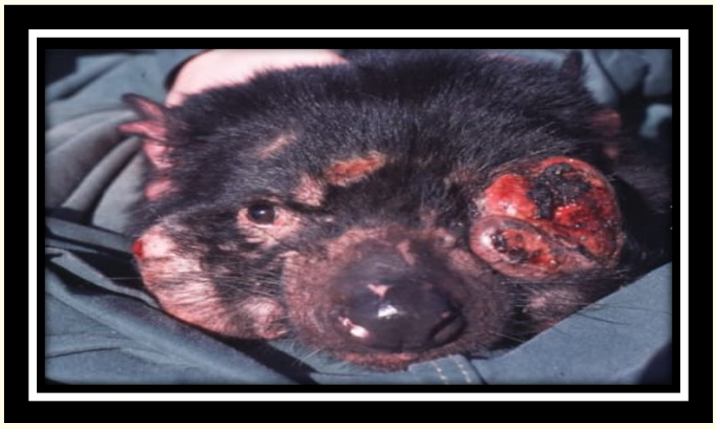

Figure 3: *Tasmanian devil with devil facial tumor disease (DFTD) (Photo adapted from Meena Jones) [19].*

Conclusion

The present review discusses a type of naturally occurring transmissible cancer disseminated with the help of cancer cells in dogs and Tasmanian devils. These cancer cells are usually transmitted to other individuals via the act of sniffing, licking and mating.

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Ethical Clearance

Since the article is purely a review work hence it does not require ethical clearance.

Conflict of Interest

The authors have declared that no competing interests exist among us. They have approved the final version of the manuscript contributing equally.

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