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Mini Review

A New Era of Immuno Surgery is Coming: A Novel Eclectic Approach for Cancer Treatment with Liquid Knife & Immuno Therapy

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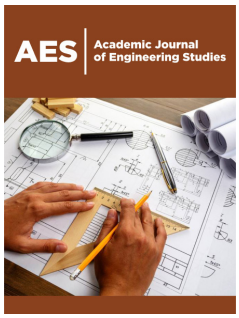

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Introduction

Cancer therapy has always included surgery, radiotherapy and chemotherapy, almost fixed in the textbooks for hundreds of years, despite a rich achievement of biomedical science encompassing bioengineering. A lot of clinical trials with new drugs or medical equipment's have brought a hope for cancer treatment with strict selection for trial candidate of patients. Cancer patients still feel hopeless while doctors and scientists feel very happy for the achievement in all the fields. I am as a 40-year clinical oncologist, I found that most oncology clinician always keep a hard brain, no matter how medical science progresses, also the surgery can't put down the scalpel and think of a better way before surgery, surgery should think how to protect the patient's body perfectly intact, prevent tumor metastasis, even how to use tumor death to induce the immune vaccines. Cancer immunological therapy is getting very popular, and many new drugs have been approved by FDA like PD1 and PDl-1, however, in clinical practice of cancer treatment, it looks very limited efficacy for advanced cancer, so that physician started to use comprehensive plan by combination chemotherapy with PD1 as a novel strategy with a better clinical benefit. Since chemotherapy and radiation therapy always produce the side effect like loss hair, vomit and neutropenia, and surgery is limited for many later stages of cancers, also surgery damages body shapes with lose functions, esophageal cancer was removed with reconstruction and put stomach into chest and stomach never has normal function; a lot of cases showed surgery can't be performed because tumor location in special site, like tumor location in posterior vaginal wall or vaginal carnal, surgery just is not allowed to do the procedure, if remove the tumor in these location, it will make a hole to connect to the rectal. Due to the extremely toxic side effects, many cancer patients cannot be successfully completed a surgery or a complete course of chemotherapy or radiation therapy, and some cases even die from the side effects of surgery or chemotherapy or radiation therapy due to a patient's poor tolerance.

In 1994, Dr. Yu developed the new concept of using the tumor itself as a drug carrier. Injection of anti-cancer drug ethanol saturated liquid into the tumor can generate a kind of intratumoral autologous therapeutic coagulum which can function as an antitumor drug depot. This autologous therapeutic coagulum can sustain or store anticancer drug in the tumor and the surrounding tumor tissues to kill the tumor cells that have not been killed through ethanol coagulation treatment. Today the coagulum has been improved to a more effective in clinical cancer therapy by using the H_2O_2 replaced ethanol. It was found oxidant of H_2O_2 is playing good role to replace the ethanol to coagulation of tumor as a drug carrier for slow releasing [1-3]. Dr. Yu also published many papers showing that the combination of intratumoral drug with hapten modification improves the immunogenicity of tumor cells, effectively inducing or

activating body's antitumor immune response and had over 1000 patients with different cancer reported with good results [4-7]. It indicates that when hapten is added to the UMIPIC Ultra-Minimum Incision Personalized Intratumoral Chemoimmunotherapy Therapy, it plays an important role in stimulating immune response.

Recently, Dr. Yu applied UMIPIC for cancer surgery, one of late stage of rectal cancer, during the process of surgery, while preparing the surround tissue, the combination of drugs with hapten was injected into the tumor, both of tumor samples were taken from tumor before, during and after the surgery, also we take the blood samples as same as tumor sample. Single cell sequence was taken placed for comparison expression of genes related immune. It was found that the various immunization in biopsy sample cells, predominate B cells, macrophages, NK/NKT cells, niave T cells, monocytes, neutrophils. In addition to tumor cells, the surgical samples contained more macrophages/dendritic cell and niave T cells. After the intratumoral injection with chemotherapy drug and hapten, the patient developed an immune response within half of an hour during of surgery and a large number of immune cells were enriched in the puncture sample, including NK/NKT, B cells, macrophages/dendritic cells, and neutrophils. The patient's peripheral blood cell fraction shows signs of postoperative inflammation: neutrophil of richness. The proportion of plasma cells in the peripheral blood of the patient was significantly increased 7 days after the operation, it is indicating that the B cells were activated by the neuantigen and began to produce antibodies.

Conclusion

Local tumor treatment during of surgery likely elicited a rapid local immune response, followed by a systemic immune response, and stimulated tumor-specific antibody production for immuno inercept, it may reduce the metastasis or recovery of cancer after surgery.

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