

Pioneers of Paediatric Oncology

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Abstract

Now days because of various factors malignancy incidences are increasing in all levels of socioeconomic strata of communities. So the main aim of this article is that new generation of doctors should be aware of this all pioneers including paediatricians.

Keywords: Oncology; Paediatrics; Pioneers; Old age.

2650 to 1950 BC

The first references of cancer goes back to this time, when in three Egyptian papyri detected the breast tumor together with a uterine carcinoma.[1]

1900-1600 BC

The earliest evidence of tumor was found in the skull of a female from Bronze Age period. [1]

(*Egyptian papyri*)



(*Hippocrates*)



460 BC-370 BC

Hippocrates was first to describe various kinds of cancer. As per Greek words 'carcinus' means- crab or crayfish. He described the

(*Aurelius Cornelius Celsus*)



(Galen)

appearance of cut malignant tumor as the veins stretched on all sides like the crab has its feet, so the name was kept. Also in Greek words swelling is known as oma, so he later add suffix and named as carcinoma.[1]

25 BC-50 AD:

Aurelius Cornelius Celsus translated carcinos into the Latin cancer, meaning crab. Also he described the phenomenon of metastatic process in malignancies.[1]

Claudius Galenus (Galen) (129-199 AD)

He was from Greek, who described benign tumors as "oncos" meaning as swelling. Also he was pioneer to introduce the term

(Nicolaes Tulp)

'sarcoma' from the Greek word 'sarca' (flesh). [1]

Wilhelm Fabry (1560 Jun 25-1634 Feb)

He was a German professor, who believed that breast cancer was caused by a milk clot in a mammary duct. [1]

Nicolaes Tulp (1593 Oct 09-1674 Sep)

He believed that cancer was a poison that slowly spreads and it was contagious.[2]

Francois de la Boe Sylvius (1614 May 11-1672 Nov 10)

He was a Dutch professor, who believed that all diseases were the outcome of chemical processes and acidic lymph fluid causes the

(Wilhelm Fabry)*(Sylvius)*

(Sir Percivall Pott)



cancer.[2]

Jean Godinot (1661-1749)

He was a pioneer in starting the first cancer hospital in the world in Rheims (1740), which was dedicated to the cancer patients.[1]

Sir Percivall Pott (1714 January 6 - 1788 December 22)

He was an English surgeon, first to demonstrate that a cancer may be caused by an environmental carcinogens.[3]

John Hunter (1787)

He was first to operate on metastatic melanoma.[1]

(John Hunter)



(René Laennec)



Rene Laennec (1804)

He was the French physician, who was first to describe melanoma as a disease entity. His report was initially presented during a lecture for the Faculte de Medecine de Paris and then published as a bulletin in 1806.[2]

Campbell Greig De Morgan (1811 November 22-1876 April 12)

He was a British surgeon who first mentioned that cancer arose locally and then spreads first to the lymph nodes and then more widely in the body.[4]

Thomas Hodgkin (1832)

He was a pathologist, first to described a

(Thomas Hodgkin)



(John Templeton Bowen)

form of lymphoma, which was named as of Hodgkin's disease.[5]

John Templeton Bowen (1857–1940)

He was an American dermatologist, who named Bowen's disease and Bowenoid papulosis.[1]

William Coley (1862 January 12-1936 April 16)

He was an American bone surgeon and cancer researcher, pioneer of cancer immunotherapy. In 1908, he identified an alpha tumor necrosis factor.[5]

Rudolf Virchow (1864)

A German physician who was first to describe an abdominal tumor in a child as a

(William Coley)*(Rudolf Virchow)*

"glioma" The characteristics of tumors from the sympathetic nervous system and the adrenal medulla were then noted in 1891 by German pathologist Felix Marchand.[6]

James Stephen Ewing (1866 December 25-1943 May 16)

He was an American pathologist, who discovered a form of malignant tumor which is known as EWING SARCOMA. [1]

Ludwig Pick (1868–1944)

He coined the term Pheochromocytoma in 1912 and described the chromaffin color change in tumor cells associated with adrenal medullary tumors. [1]

(Ludwig Pick)

(Emil Herman Grubbe)



James Homer Wright (1869 April 8-1928 January 3)

He was an American pathologist, who was chief of pathology at Massachusetts General Hospital. He is the same "Wright" for which Wright's stain, and the "Homer Wright rosettes" associated with neuroblastoma.[6]

Emil Herman Grubbe(1875 January 01-1960 March 26)

Emil Herman Grubbe -He was the first American to use x-rays the for treatment of cancer.[7]

Frankel (1886)

Frankel made the first description of a patient with Pheochromocytoma.[1]

(Marie Curie)



Marie Curie and Pierre Curie (19th century)

Marie Curie and Pierre Curie discovered radiation, the first effective non-surgical treatment of cancer patients.[3]

Theodor Boveri (1902)

He was a German professor of zoology at Munich, who identified the genetic basis of cancer. He studied that mutations of the chromosomes can generate a cell with unlimited growth potential which passes onto its descendants. He proposed the existence of tumor suppressor genes and oncogenes, also mentioned that cancers might be caused or promoted by radiation, physical or chemical insults or by pathogenic microorganisms.[4]

(Pierre Curie)



(Theodor Boveri)



(Dr Sidney Farber)*J. J. Thompson (1903)*

He discovered the presence of radioactivity in well water. That's why preparations of radium salt in bath water was suggested as a way for patients to be treated at home, as the radio-activity in the bathwater was permanent. Radium baths became used experimentally to treat arthritis, gout, and neuralgias.[3]

Dr Sidney Farber (1903–1973)

He was a paediatric pathologist, who is regarded as the father of modern chemotherapy. He evaluated the role of aminopterin as a folate antagonist in childhood acute lymphoblastic leukemia. He showed for the first time that induction of clinical and hematological remission in this disease was achievable.[8]

(Niels Finsen)*(Max Wilms)**Niels Finsen (1905)*

He discovered that lupus was amenable to treatment by ultraviolet rays when separated out by a system of quartz crystals, and thereafter created a lamp to sift out the rays. The Finsen lamp became widely used in for phototherapy. Finsen was soon awarded a Nobel prize for his research.[1]

Max Wilms (1910)

He was pioneer in the study of tumor cells originating during the development of the embryo, known as "nephroblastoma" or Wilms' tumor. This is a malignant tumor of the kidney. He did extensive work in the field of radiology, using radiation therapy for treatment of tumors and tuberculosis.[1]

(Patrick S.)

Roux & Mayo (1926)

Roux (in Switzerland) and Mayo (in U.S.A.) were the first surgeons to remove pheochromocytomas.[1]

Janet Lane-Clayton (1926)

He observed that the bone marrow of victims of the atomic bombs of Hiroshima and Nagasaki was completely destroyed. From these observations, he concluded that diseased bone marrow could also be destroyed with radiation and this led to the development of bone marrow transplants for leukemia.[1]

Charles Heidelberger (1950)

He synthesized the fluoropyrimidine 5-fluorouracil, which had a broad-spectrum activity against various types of solid tumors.[10]

Patrick S. Moore (1956 October 21)

He was an American virologist who co-discovered together with his wife, Yuan Chang, two different human viruses causing the AIDS-related cancer Kaposi's sarcoma and the skin cancer Merkel cell carcinoma.[11]

Yuan Chang (1959 November 17)

She was an American virologist and pathologist who co-discovered the two human cancer viruses-Kaposi's sarcoma associated

herpes virus and Merkel cell polyomavirus. [12]

Copp and Cheney (1962)

They purified Calcitonin and was considered as a secretion of the parathyroid glands, later identified as the secretion of the C-cells of the thyroid gland.[13]

DeVita VT, Moxley JH, Brace K, Frei E III (1965)

They developed for the first time the MOMP program for Intensive combination chemotherapy and X-irradiation in the treatment of Hodgkin's disease.[14]

Anthony Epstein, Bert Achong and Yvonne Barr (1968)

Anthony Epstein, Bert Achong and Yvonne Barr identified the first human cancer virus, called the Epstein - Barr virus.[14]

HeLa. Gold, Michael (1973)

He discovered oncoviruses.[15]

Harald zur Hausen (1984)

He discovered first human papillomaviruses -HPV16 and HPV18, which were responsible for cervical cancers. For this discovery, he was honored with Nobel Prize in 2008.[1]

(Yuan Chang)*(Sir Michael Anthony Epstein)*

(Harald zur Hausen)

1980

Paediatric oncology as a specialty was virtually nonexistent in the India. Most children were treated by adult oncologists. The first dedicated paediatric cancer unit was started in Tata Memorial Hospital in 1985.[15]

John A. Boockvar (2009)

An American neurosurgeon, who performed the world's first intra-arterial delivery of the high-potency chemotherapeutic agent Avastin (bevacizumab) directly into a malignant brain tumor. He started a new era of "interventional neuro-oncology.[16]

(John A. Boockvar)*Fathers figures of cancer pathology*

Giovanni Battista Morgagni, Marie-Francois Xavier Bichat, Johannes Muller and Rudolf Ludwig Karl Virchow were known as father figures of cancer pathology. They were the first to describe microscopically the appearance of malignant tumors, the tumor stroma, the pathways of metastases and the association of inflammation and cancer.[17]

History of radiotherapy

1869: The 'cathode rays' were discovered by Hittorf.

1895: Roentgen made the first X-ray photo.

1896: Voigt in Germany irradiated the first

(Giovanni Battista Morgagni)

(1682–1771: from Padua)

(Marie-Francois Xavier Bichat)

(1771–1802: from France)

(Johannes Muller)



(1801-1858)

patient with a cancer of the throat.

1939: Cyclotron was invented.

1940: Betatron was invented.

1948: Cobalt-60 unit was invented.

1953: Brachytherapy and linear accelerator was invented.

History of Chemotherapy

460-370 BC: Hippocrates's remedy was a mixture of momordica elaterium, cucumber honeycomb and water in juice was used for treatment of cancer.

100AD: Dioscurides of Anazarous used terebinth oil, frankincense, hedge mustard and honey in plasters for hidden cancers.

100AD: Leonides of Alexandria used ass's

(Rudolf Ludwig Karl Virchow)



(1821-1902: from Germany)

milk, opium, pork fat, fresh butter and rose oil in plasters for cancer treatment.

200AD: Galen of Pergamum used an ointment consisting of calcined shells of whelk, purple shell fish, oysters, sea urchin, crab, sour wine, honey, pork fat for external cancers.

1900: German chemist Paul Ehrlich coined the term "chemotherapy".

Dr. Min Chiu Li (1968): He was a pioneer chemotherapist who developed new curative chemotherapy for metastatic choriocarcinoma and testicular cancer.

20th century: The use of chemotherapy for the treatment of cancer began.

1910: George Clowes of Roswell Park Memorial Institute in New York, developed the first transplantable tumor systems in rodents.

(Hittorf)



(Paul Ehrlich)



Gustaf Lindskog (1946): He was a thoracic surgeon, who administered nitrogen mustard to a patient with non-Hodgkin's lymphoma having severe airway obstruction. Marked regression was observed in this and other lymphoma patients. The use of nitrogen mustard for lymphomas spread rapidly throughout the United States after the publication of this article.

1949: Farber, Heinle and Welch tested folic acid in leukemia and they came to the conclusion that it actually accelerated leukemia cell *growth*.

1950: Penicillin was initially thought to have antitumor properties that were never confirmed. But later on another antibiotic, actinomycin D was studied for antitumor properties and which is commonly used in pediatric tumors.[18]

1948: Farber showed the antifolate activity of methotrexate in childhood leukemia.

Despite all these inventions and modalities of management, the morbidity and mortality related with paediatric malignancies is challenge to forthcoming paediatricians and paediatric oncosurgeons. The important message by this "*History Of Paediatric Oncology*" is to relieve pain of child and his family due to malignancy.

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