ΕΥΡΩΠΑΪΚΗ ΕΤΑΙΡΕΙΑ ΙΣΤΟΡΙΑΣ ΤΗΣ ΟΓΚΟΛΟΓΙΑΣ 2014
EUROPEAN SOCIETY OF THE HISTORY OF ONCOLOGY

The Hellenic Medical Society UK

THE EUROPEAN SOCIETY FOR THE HISTORY OF ONCOLOGY
and
THE HELLENIC MEDICAL SOCIETY - UK

PRESENT

AN INTERNATIONAL COLLOQUIUM
on

PALAEO-ONCOLOGY
The Antiquity of Cancer

Friday 16 November 2018
at
THE HELLENIC CENTRE
16-18 PADDINGTON STREET
LONDON, W1U 5AS, U.K.

ESO Recommended Event

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Please contact

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WELCOME

The *European Society for the History of Oncology*, *The Hellenic Medical Society*-UK and the *Hellenic Centre,* extend a warm welcome to the participants of this International Colloquium on PALAEO-ONCOLOGY.

Cancer, in one form or another, afflicts a multitude of living organisms across species and as a biological process, neoplasia, an aberrant proliferation of cells, is as old as life on earth. Today we recognise that phytoviruses can be responsible for unnatural growths even on plants.

The *European Society for the History of Oncology* (EEIO-ESHO) was founded in 2014 by a group of oncologists and medical historians with academic links in Britain, Cyprus, Greece and Switzerland and I am pleased that the core of the founder members is here today, contributing to the programme. I am enormously grateful for their support and help in convening this meeting. Our objectives are the study of, and research into, the evolution of the science of Oncology, the origins of which are lost in the mist of time.

The Hellenic Medical Society-UK (HMS-UK) was founded in the early 1980's as a multidisciplinary medical forum. Thirty-five years later it is a vibrant association of Greek Physicians and Bio-Medical Scientists, working in the UK. I am grateful to my colleague, Dr Miltiadis Krokidis, President of the HMS-UK, for his help and collaboration.

This conference would not materialize without the generosity of the **A. G. LEVENTIS** foundation and we are very grateful indeed for their support and for providing us with an Educational Grant for this purpose.

Our appreciation goes to the **AEGEAN airlines** for their generosity and for providing free air travel for some of our speakers from Greece.

The **European School of Oncology, (ESO)** endorsed the educational content of this colloquium and has granted the label **ESO recommended event**. It is a particular honour and a pleasure to welcome to our meeting the President of **ESO**, **Professor Alberto Costa** and his team.

Finally, I am grateful to all the speakers and chairs, some travelling from far afield, all self-supporting, for their contribution to this meeting.

For our overseas participants, our conference provides the opportunity to visit London, a multi-ethnic, pulsating metropolis of the world, rich in culture and tradition.

In the year 2018, The Royal College of Physicians of London commemorates 500 years of continuous existence since its foundation in1518. The college's emblem has been adorned with the first Hippocratic aphorism. Its founder and first President, Thomas Linacre, a Greek and Latin Scholar, translated into Latin, Galen's original texts, which include copious references to "unnatural growths" and "cancer", still relevant to clinical practice today. Participants may wish to seek the opportunity to visit this ancient institution and its remarkable building.

I thank you all for finding the time to be with us today and I wish you a productive conference and a pleasant stay in London.

Spyros Retsas
Convener and President EEIO-ESHO

Friday, 16 November 2018

Programme

9:00-9:30		**Registration and Welcome**	
	Speaker	**Title**	**Chair**
9:30-10:00	Professor Nicholas Pavlidis	**The History of Cancer on Planet Earth**	D. Kardamakis
10:00-10:30	Mr. Krishna Kunzru	**Tumours in Ancient India**	
10:30-11:00	Dr Photini McGeorge	**Palaeo-oncological Findings in Prehistoric Crete and the Palaeopathology of Brain**	C. Sarraf
11:00-11:30	Mr. Mike Savvas	**Women of Classical Athens and Gynaecological Oncology in the Era of Hippocrates**	
11:30-11:45	**Coffee**		
11:45-12:15	Dr Spyros Retsas	**On the Antiquity of Cancer: perceptions of "metastasis" through the ages**	C. Gardner-Thorpe
12:15-13:00	Professor Stefanos Geroulanos	**Keynote Address - "The Origins of Bioethics"**	
13:00-14:00	**Interval**		
14:00-14:30	Dr Stella Geronikolou	**Cancer in the Arab and Islamic World**	M. Krokidis
14:30-15:00	Ms Shan Jiang	**Naming; Tool; Operation: Knowledge of Tumour in the Era of Chinese Classics**	Ph. McGeorge
15:00-15:30	Ms Paula Veiga, PhD (c)	**Cancer in Ancient Egypt**	
15:30-16:00	Ms Casey L. Kirkpatrick PhD (c)	**The Palaeopathology of Cancer: Past, Present and Future**	
16:00-16:15	**Tea**		
16:15-16:45	Professor Dimitrios Kardamakis	**The first modern Olympiad and the introduction of Radiology in Greece**	N. Pavlidis
16:45-17:15	Dr Miltiadis Krokidis	**The Origins and Evolution of Interventional Radiology in Oncology**	
17:15-17:30	**Discussion**		S. Retsas
17:30	**Close**		
18:00	**HMS-UK HIPPOCRATIC ORATION 2018 Professor Panayotis N. Soucacos MD, FACS**	**Unraveling the Mysteries of Congenital Anomalies of the Upper & Lower Extremities, with Deviation from Normality, in Ancient Mythology to Modern Medicine.**	M. Krokidis

PALAEO-ONCOLOGY
The Antiquity of Cancer

FACULTY

GARDNER-THORPE	Christopher	President, Faculty of the History and Philosophy of Medicine and Pharmacy, and History Courses Director, Society of Apothecaries, London, UK
GERONIKOLOU	Stella	Research Fellow, Bio-Academy of Athens, Greece
GEROULANOS	Stefanos	Professor of Surgery and of History of Medicine, Athens, Greece
JIANG	Shan	Institute of Medical Humanities, Peking University, Beijing; and UCL-visiting Fellow, China
KARDAMAKIS	Dimitrios	Professor of Radiation Oncology and Dean, School of Health Sciences, University of Patras, Greece
KIRKPATRICK	Casey	Palaeo-pathologist, PhD Candidate, Western University, Canada
KROKIDIS	Miltiadis	Consultant Interventional Radiologist, Cambridge University Hospitals and President, Hellenic Medical Society-UK
KUNZRU	Krishna	Past-President Section of History of Medicine, Royal Society of Medicine, London, UK
McGEORGE	Photini	Archaeologist-Anthropologist, Athens, Greece
PAVLIDIS	Nicholas	Emeritus Professor of Medical Oncology, University of Ioannina, Greece
RETSAS	Spyros	Convener and President, European Society for the History of Oncology, London, UK
SARRAF	Catherine	Immediate Past-President, Section of History of Medicine, Royal Society of Medicine, London, UK
SAVVAS	Michael	Consultant Obstetrician and Gynaecologist and Past President, Section of Obstetrics and Gynaecology, Royal Society of Medicine, London, UK
VEIGA	Paula	PhD Candidate, Institut für Ägyptologie, Ludwig-Maximilians-Universität München, Germany

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ABSTRACTS

in order of presentation

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THE HISTORY OF CANCER ON PLANET EARTH.

Nicholas Pavlidis MD, PhD. Emeritus Professor, University of Ioannina, Greece.

The present lecture tries to answer crucial questions related to the existence of cancer on planet earth. In particular, will refer to: a) the absence of cancer in the non-animal kingdom species, b) the rarity or absence of cancer in the invertebrate animals, c) the "Cancer – like Disease" (accumulation of colonies or stem cells, but without tumour formation) which may appear in certain invertebrates i.e sponges, mollusks, corals, etc, d) the presence of benign and malignant tumours in vertebrate animals, e) the fossil record of neoplasms before man, f) the incidence of cancer over the evolution of the vertebrates (from the Paleozoic to Cainozoic Eras), g) the first neoplasms seen in the animal kingdom and in hominid species and h) the rarity of cancer in certain animals like in the big elephants or whales who carry 1.000 times more cells (Peto's Paradox), or in wild animals as compared to domestic animals.

In addition, it will briefly cover the presence of cancer in ancient human populations as in Egypt (evidence from Egyptian mummies), Greece and China. Furthermore, data from ancient European populations from Bronze and Medieval ages, as well as, from Prehistoric America will be presented.

TUMOURS IN ANCIENT INDIA - A READING OF *Suśrutasaṃhitā.*

KMN Kunzru and Radha Bhat, London, UK.

The Indian Surgeon/ Physician *Suśruta* practised and taught in the mid First Millenium BCE in Varanasi, North India. His teachings (oral and practical) were compiled into a Compendium, *Suśrutasaṃhitā.* The Compendium describes Causation and Diagnosis of various diseases and their treatment, both Medical and Surgical. The Work was written down later when a definite Sanskrit script, *Brāhmī,* developed (probably in Mauryan/ Alexandrian time, c.4th.C.BCE). The Compendium has been further edited (and redacted) at least twice. Firstly, by a surgeon, *Nāgārjuna*, in the last quarter of the First Century BCE. Then, by a physician (non-surgeon), *Ḍalhana,* in the 12th. c. CE, the manuscript available to us today, written in the currently used *Devanāgarī* script.

The Compendium has no diagnostic entity classed as "Tumour", but there are good clinical descriptions of tumour like conditions (both lumps and ulcers), their "causation" and diagnosis, and their treatment. These conditions are clearly distinguished from inflammatory and traumatic lesions presenting as lumps and ulcers. All are attributed to imbalance of "bodily humours" (described in our handout on Principles).

We present modern pathological and clinical specimens that we have found, equating to these lesions.

We also present the therapeutic approach of *Suśruta* for these lesions, selecting only those for treatment that were likely to be "cured" or "ameliorated".

The separate handout describes *Suśruta's* Principles of Origin and Treatment of Disease (with some Sanskrit terms), and their treatment. Also included in the handout are a Bibliography, and Acknowledgements.

PALAEO-ONCOLOGICAL FINDINGS IN PREHISTORIC CRETE.

Photini McGeorge, Athens, Greece.

Four cases of bone neoplasms in prehistoric skeletal material will be presented. These cases were identified during studies of human remains from archaeological sites dated to the Bronze Age in Crete.

- The earliest example from an Early Minoan I/II context, C^{14} dated to between 2717 ± 110 BC and 2240 ± 66 BC, is a possible case of Paget's disease affecting a tibia.
- The next example from an Early Minoan III/ Middle Minoan I context dated between 2200 and 1950 BC, is a possible case of Paget's disease also in a tibia.
- Two cases are from a Late Minoan IIIA/B cemetery dated between 1390 and 1190 BC. One is a possible osteosarcoma of the right ulna of a middle-aged man; the other is a possible metastatic cancer to bone affecting the lumbar vertebrae and sacrum of a different male individual.

The first tibia comes from the Platyvola Cave, used for both habitation and burials. The second tibia is from the Gerontomouri Cave, where several hundred secondary burials and numerous grave gifts, originally buried elsewhere as primary burials, were transferred in the tumultuous Middle Minoan IIB period. The bulk of the associated pottery dates to the EMIII-MMI period, so this is considered to be the date of most of the burials. Burials in these natural caverns are co-mingled; thus, neither tibia can be evaluated as part of an entire skeleton. The last two cases are inhumation burials in chamber tombs at the LMIII cemetery of Armenoi, where abundant grave gifts have a strong Mycenaean character.

PALAEOPATHOLOGICAL INVESTIGATION OF GEOPOIESIS OF A 5TH CENTURY BC BRAIN.

P.J.P. McGeorge[1], Y. Christodoulou[2], F. Badounas[3], F.W. McCoy[4], N. Kourou[5].

We present the palaeopathological investigation of geopoiesis of a brain of a young woman, between 18 to 25 years of age, from a 5th century BC tomb excavated in the cemetery of the acropolis of Exombourgo on the Island of Tenos in the Aegean. In the oral cavity of the skeleton we discovered an Athenian coin of the Classical period bearing the image of an owl. The diagnostic and analytical examination of the find is in progress. From macroscopic examination and CAT scan imaging, the specimen appears to be a geopoiesis of the brain, preserved in all probability due to spontaneous 'saponification' after burial. The upper section of the brain is flattened 1 cm to the left of its median plane, extending over a small area of the left hemisphere, the greater part of the *fissura longitudinalis cerebri* and one-third of the right hemisphere. The find has been reproduced by 3D printing for the purposes of exhibition and to permit samples to be taken for further analyses. The histological sections examined forensically under the microscope, confirm the substance of the find, providing corresponding images. Biomolecular and DNA analyses will follow. From the prehistoric period to the present, this is the first discovery of its kind in Greece.

[1] Hon. Research Fellow, Tenos Excavations, University of Athens, School of Philosophy.
[2] Forensic Pathologist.
[3] Hellenic Pasteur Institute, Department of Animal Models for Biomedical Research Transgenic Technology Laboratory.
[4] Professor of Geology, Geophysics & Oceanography — University of Hawaii
[5] Professor Emeritus, University of Athens, School of Philosophy.

WOMEN OF CLASSICAL ATHENS AND GYNAECOLOGICAL ONCOLOGY IN THE ERA OF HIPPOCRATES. Michael Savvas, London, UK.

In the era of classical Athens, we see medicine moving away from superstition and religion to a rational thought and science. The prime example of this is the Hippocratic treatise on the *sacred disease* where the author argues that *epilepsy is no more sacred than any other ailment* (οὐδὲν τι μοι δοκέει τῶν ἄλλων θειοτέρη είναι νούσων οὐδὲ ἱερωτέρη).

In this period of enlightenment, the majority of women in ancient Greece, with the exception perhaps of Sparta, lived a domesticated existence of daily household chores, childbearing and rearing of the children.

In ancient Greece, women (or girls) would marry very soon after puberty around the age of 15. Pregnancy at this very young age could be hazardous and would have been associated with a high maternal mortality. Perhaps this is what Medea was referring to, when she stated *"I would rather stand my ground three times among the shields, than face childbirth once".*

Yet, classical Greek literature is full of powerful female characters, such as Medea; who are virtuous and loyal like Penelope; or strong and principled as Antigone. In Aristophanes' Lysistrata we see women taking control of the Acropolis and force men to put an end to war, by imposing sexual deprivation.

In this cultural and societal environment medical care of women would be provided routinely by older women who supported in childbirth and were also often responsible for caring for the sick within the household.

Nevertheless, proper medical care delivered by practitioners of the Hippocratic and Galenic tradition was promptly available to women, as it is evident by the copious case-reports of female patients in the Hippocratic Corpus and the multitude of treatises on gynaecological diseases and related conditions; (ΠΕΡΙ ΓΥΝΑΙΚΕΙΗΣ ΦΥΣΙΟΣ, ΓΥΝΑΙΚΕΙΩΝ ΠΡΩΤΟΝ, ΓΥΝΑΙΚΕΙΩΝ ΔΕΥΤΕΡΟΝ, ΠΕΡΙ ΠΑΡΘΕΝΙΩΝ, ΠΕΡΙ ΕΠΙΚΥΗΣΕΩΣ, ΠΕΡΙ ΕΓΚΑΤΑΤΟΜΗΣ ΕΜΒΡΥΟΥ, ΠΕΡΙ ΓΟΝΗΣ, ΠΕΡΙ ΦΥΣΙΟΣ ΠΑΙΔΙΟΥ, ΠΕΡΙ ΑΦΟΡΩΝ, ΠΕΡΙ ΕΠΤΑΜΗΝΟΥ, ΠΕΡΙ ΟΚΤΑΜΗΝΟΥ).

Cancer would not have escaped the clinical acumen of the followers of Hippocrates and in the Second book of Gynaecological Diseases there is a lucid description of uterine carcinoma with involvement of inguinal lymph nodes.

Six centuries later, Soranus of Ephesus ($1^{st}/2^{nd}$ c. AD), the biographer of Hippocrates is credited with the first description of the Apgar score and numerous gynaecological treatises, claiming the accolade of "the first ever gynaecologist".

The professional attitude and respect of the dignity of all and every patient, free or slave, man or woman is codified in the Hippocratic oath. «ΕΣ ΟΙΚΙΑΣ ΔΕ ΟΚΟΣΑΣ ΑΝ ΕΣΙΩ ΕΣΕΛΕΥΣΟΜΑΙ ΕΠ' ΩΦΕΛΕΙΗ ΚΑΜΝΟΝΤΩΝ, ΕΚΤΟΣ ΕΩΝ ΠΑΣΗΣ ΑΔΙΚΙΗΣ ΕΚΟΥΣΙΗΣ ΚΑΙ ΦΘΟΡΙΗΣ, ΤΗΣ ΤΕ ΑΛΛΗΣ ΚΑΙ ΑΦΡΟΔΙΣΙΩΝ ΕΡΓΩΝ ΕΠΙ ΤΕ ΓΥΝΑΙΚΕΙΩΝ ΣΩΜΑΤΩΝ ΚΑΙ ΑΝΔΡΩΝ , ΕΛΕΥΘΕΡΩΝ ΤΕ ΚΑΙ ΔΟΥΛΩΝ».

ON THE ANTIQUITY OF CANCER: PERCEPTIONS OF "*METASTASIS*" THROUGH THE AGES.

Spyros Retsas, Loughton, Essex, UK.

The question is not whether cancer existed in Greek antiquity - it did! - but whether physicians of that period recognised the disease as a distinct Nosologic entity - which they did!

At least fifteen medical authors write about cancer in a literature spanning a period of twelve centuries from Hippocrates (5th c. BC); to Galen and Leonidas (2nd c. AD); to Paul of Aegina (7th c. AD), to mention only a few representative names.
Excerpts from the writings of these authors, on the onomatology of cancer, physical signs, diagnosis, prognosis and treatment will be discussed.

The ancients recognised that cancer could adhere to underlying tissues, thus influencing the surgical treatment of breast cancer. They were also aware, since the days of Hippocrates, that a tumour could spread from the primary site to proximal tissues such as regional lymph nodes; for this development however, they used the term *sympathy* (A. Kouzis, 1902). Whether they perceived *metastasis*, the most dramatic moment in the evolution of a cancer, as it is understood today, *i.e.* dissemination to distant organs, is less certain.
An intriguing passage from Galen, raises the possibility that the ancients recognised also the spontaneous involution of tumours, a phaenomenon convincingly documented in the cancer literature of the twentieth century. (Τὸ ἀφανισθῆναι τινα τῶν παρὰ φύσιν ὄγκων εἰπεῖν οὐ ταὐτὸν σημαίνει τῷ παύσασθαι φάναι. ΓΑΛΗΝΟΥ ΕΙΣ ΤΟ ΙΠΠΟΚΡΑΤΟΥΣ ΠΡΟΓΝΩΣΤΙΚΟΝ ΥΠΟΜΝΗΜΑ Β΄. Galeni opera omnia / Kühn, K.G. (ed), Leipzig 1821-1823; Vol. 18b, 221-224).

The word *metastasis* is first attested to the lyric poet Simonidis (6th-5th c. BC). It means removal or migration, dislocation, but also departing from life.
In a medical context *metastasis* means the *transference* of the seat of disease. There are at least nine references to *metastasis* in the Hippocratic corpus but in a context unrelated to cancer.

Metastasis makes its entry in the English language in late 16th century but as a rhetorical rather than medical term.

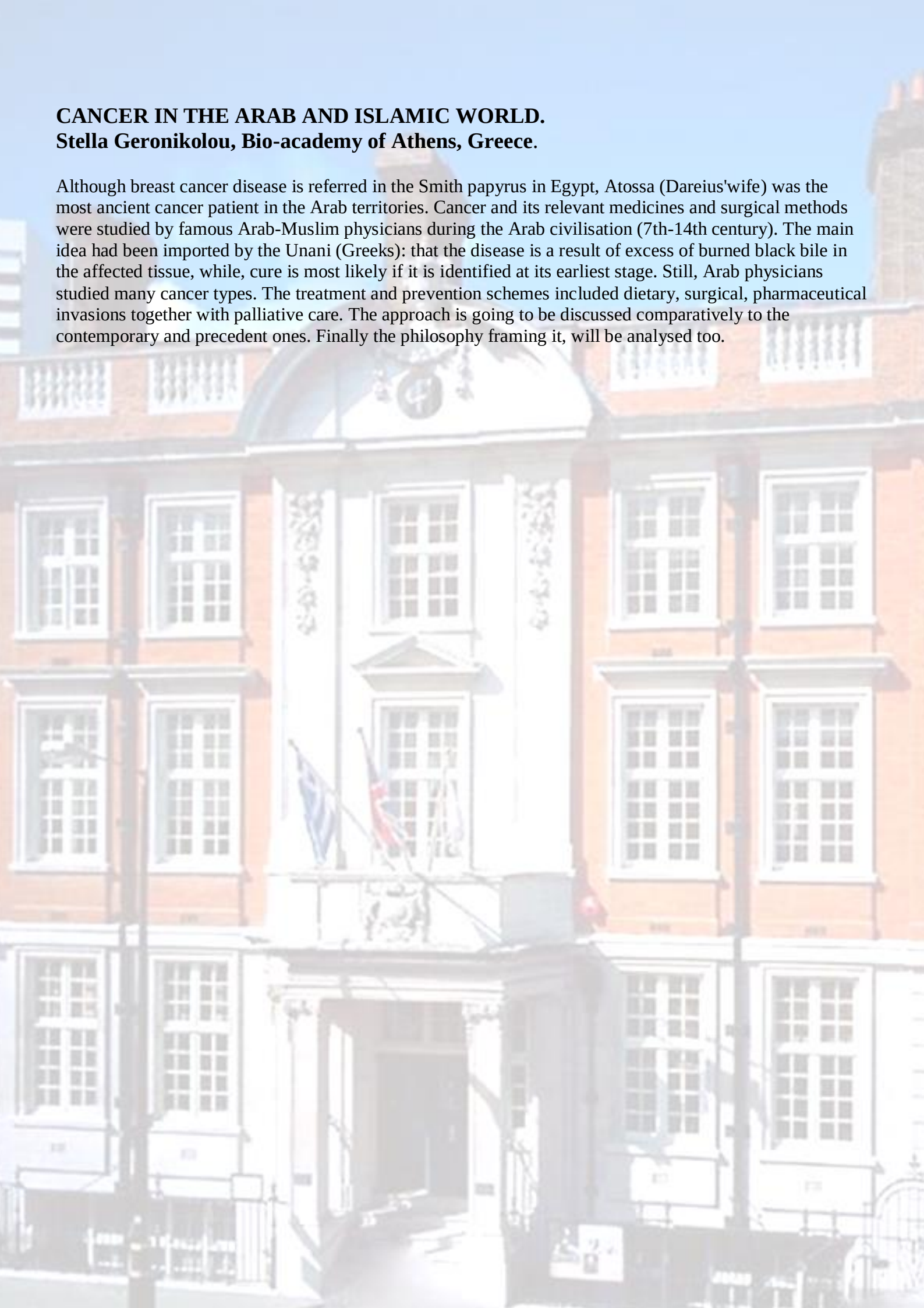
This presentation examines the period in the history of medicine in which *metastasis* came to mean *cancer dissemination*.

It would appear that the current meaning of *metastasis* to denote cancer spreading to distant organs, is established in the early 20th century, because of better understanding of the biology of neoplasia, probably as a result of the paper by Thomas R. Ashworth (*Australian Medical Journal.* 1869. *14: 146–7.*), introducing the concept of circulating cancer cells in the peripheral blood.

CANCER IN THE ARAB AND ISLAMIC WORLD.

Stella Geronikolou, Bio-academy of Athens, Greece.

Although breast cancer disease is referred in the Smith papyrus in Egypt, Atossa (Dareius'wife) was the most ancient cancer patient in the Arab territories. Cancer and its relevant medicines and surgical methods were studied by famous Arab-Muslim physicians during the Arab civilisation (7th-14th century). The main idea had been imported by the Unani (Greeks): that the disease is a result of excess of burned black bile in the affected tissue, while, cure is most likely if it is identified at its earliest stage. Still, Arab physicians studied many cancer types. The treatment and prevention schemes included dietary, surgical, pharmaceutical invasions together with palliative care. The approach is going to be discussed comparatively to the contemporary and precedent ones. Finally the philosophy framing it, will be analysed too.



NAMING, EXPLANATIONS, TREATMENTS: KNOWLEDGE OF TUMOUR FROM CHINESE CLASSICS ERA. Shan Jiang, Institute of Medical Humanities, Peking University, Beijing, China. Visiting fellow at Institute of Advanced Studies, UCL.

Similar to biomedical terminology, in Chinese language, we have two terms separately naming tumour and cancer. 肿瘤 *zhongliu*, or 瘤 *liu*, has a broad sense of all types of tumour, including benign and malignant neoplasia. 癌 *ai*, on the other hand, narrowly refers to malignant neoplasia. Although treatments towards syndromes relevant to tumours had long existed in ancient Chinese medical classics, the concept of tumour was not as clear as biomedical terminology. The descriptions as well as treatments had many overlaps with other cutaneous diseases, thus it would be difficult for one to tell whether these records of experiences truly directed at tumour. Tracing back to the texts in ancient time and analysing descriptions about most similar syndromes to tumour we mean today, may help us primarily understand the knowledges of tumour that ancient practitioners had formed. The talk on this topic is narrowed in Chinese classical era (内经时代 around 25-220 CE), specifically gives analysis based on texts in 黄帝内经 (Yellow Emperor's Inner Canon), with an additional introduction about the development reflected in medical literature afterwards. The analysis includes three divisions:

- **Naming**

The most relevant characters defining tumour or cancer in Chinese, 瘤 *liu* and 癌 *ai* appeared in different ages. And the latter one was more recent. Besides, numerous different characters and words have been used to narrate similar syndromes as tumour or cancer in ancient medical literature. For instance, 岩 *yan*, 石 *shi*, 疮 *chuang*, etc. Since narratives of tumour always depended on superficial observations, they were blended a lot with sores, ulcers, and other cutaneous conditions. In addition, metaphors of plants and animals were commonly used to describe shapes of some visible symptoms caused by tumour.

- **Explanations**

Nothing about "cancer cells" existed in Chinese medical theories, thus the aetiology of tumour differed too much from biomedicine. Earlier texts drew attention on the holistic status of tumour and used 气 *qi* and 精 *jing* to explain its original cause. In some cases, clues can be found that mental problems as well as unhealthy habits were considered to be important inducements of tumour, which implies the relation of idea about health maintenance and tumour prevention.

- **Treatments**

As we mentioned above, ancient Chinese narratives on tumour were mostly based on observation of superficial changes and visible masses. Therefore, piercing and cauterizing operations were frequently used in tumour treatments. Except for some obvious direct excisions, piercing depending on traditional acupoints theory had its reasonable logic as well, some of which were even used until now.

ONCOLOGY IN ANCIENT EGYPT.

Paula Veiga, Lisboa, Portugal - PhD candidate at LMU University, Munich, Germany.

Our knowledge of oncology in ancient Egypt is derived from three main sources:

- Study of human remains: these can be both mummified and skeletonized bodies and fragments. Most of our information comes from the latter source (bones).
- Visual art or iconography: Ancient Egypt has left us with a wealth of visual art, some of which depict diseases.
- Literature: medical and magical papyri (complete and fragmented) and ostraca.

Some references are made to evidence found in Egyptian human material in various locations in Egypt that reveal the presence of tumours. The knowledge about medical practices in ancient Egypt was not acquired through autopsies or the study of human bodies as it is today; the embalmers learned about the human body and the doctors, ***swnw***, learned their craft in the Houses of Life, studying from the knowledge compiled in ancient texts.

Many names of internal organs are made from the butcher's and cook's crafts (Strouhal 1992: 243-245).

Some hieroglyphic determinants used to describe human body parts and pathologies, use the characteristics of animal body parts and this explains why they were more familiar with animal bodies (mammals) and knew that they would not be very different from human bodies.

Since the legacy of the bodies of ancient Egypt consists of mummified and skeletonized whole bodies and fragments, analysis of soft tissues is practically out of the question for diagnosis of these diseases, since it is very difficult to remove this information, given the state of preservation of bodies.

All the diagnoses to the present are controversial. What has been published since 1825 to date, makes us conclude that, the average age at death being 36 years, tumours affected mainly young people.

Nasopharynx and **uterine carcinomas** were the most common.

Different types of tumour appear to have been identified or are indicated as such by medical papyri.

According to a study carried out in 1972, the average life expectancy of the ancient Egyptians was approximately 36 years in the Dynastic age and 30 years in the Pre-Dynastic era. Mortality in young adults was extremely high in both periods (Masali and Chiarelli, 1972). Infant mortality was also very high but, of those who survived and became 20 years old, two-thirds would live on average until the age of 45 and less than half of them would reach 65. This indicates an ageing population, a group that shows a high incidence of tumours.

Although computerized tomography (CT) may reveal different layers of tissue, and objects such as amulets, revealing bones depending on their location, relative to their position in the carton, when dealing with a still bandaged mummy, little or no evidence of soft tissue is found. There are, however, more examples of bone tumours detected in the mummies of ancient Egypt, but nonetheless they are a minimal number compared to the present statistics. (Harris 2007: 201).

The concept of a tumour in ancient Egypt, according to other authors, searching for mummies of ancient Egypt in 1956-59 (Marcsik, 2000), distinguishing between simple ulcers and tumours, makes no distinction between benign and malignant tumours. Descriptions of the EP and Hearst mention tumour, ***sfw***. But the notion of tumour designates both tumour and swelling (Gyula, 1974), (Nunn 1996: 168).

The lower incidence of cancer in ancient Egypt appears to have been due to several factors: shorter life expectancy, and absence of carcinogenic factors in the environment (Nunn 1996: 64). Both the environment and diet are factors to be considered in the analysis of cancer in ancient Egypt (Ebeid 1999: 114).

Other authors say that cancers in ancient Egypt would be detected in individuals of high social strata because their diet and sedentary lifestyle made them more susceptible to this type of pathology, and that these cancers must have been incurable (Halperin, 2004). Some cases appear to be malignant tumours.

Zimmerman also says that, 'there are only a handful of tumour records in ancient human remains' (Zimmerman, 1977). We can now add a few more discoveries thanks to the development of techniques and studies done on excavated material that would not have been available before.

THE PALAEOPATHOLOGY OF CANCER: PAST, PRESENT AND FUTURE.

Casey Kirkpatrick, Department of Anthropology, Western University, Canada.

Most scientific knowledge of cancer is based upon very recent evidence, with most information coming from studies over the last 200 years. With increased understanding of the manifestation and presentation of cancers throughout thousands, if not millions, of years, researchers can work together to answer the complex questions surrounding cancers today and tomorrow. The rapidly expanding field of palaeo-oncology, the study of the global history of cancers and other neoplastic diseases, contributes to this expansion of data and our collective understanding of neoplastic diseases and their evolution. This paper delves into the development of techniques, technologies and theoretical models used in the detection and interpretation of palaeo-oncological evidence in skeletonized and mummified remains.

When palaeopathology was first introduced as a scientific endeavour, visual analysis of the bodily remains was the only available method and studies required the unwrapping and defleshing of mummified remains. These early methods were terribly destructive, and many soft tissue and bone pathologies were overlooked. Thankfully, the fields of palaeopathology and palaeo-oncology have a history of quickly adapting to incorporate state-of-the-art diagnostic tools and methods, resulting in a drastic reduction of destructive studies. For example, the first palaeo-radiological image of an ancient neoplasm was taken only two years after the discovery of x-rays, and one year after the first x-ray of bone cancer. Palaeo-oncological research has similarly incorporated more complex medical imaging techniques and histological analysis following their introduction to the world. Most recently, biomolecular methods of analysis, such as aDNA and proteomic analyses, have begun to make an impact on palaeo-oncological research with promising results. This paper begins with a historical review of the development of the palaeo-oncological toolbox enabling the minimally invasive analysis of physical remains and the limitations of these methods.

Following this history of palaeo-oncological methodology, attention is turned to the quantification of the use of these methods in palaeo-oncological studies to date. This information is gleaned from the CRAB (Cancer Research in Ancient Bodies) Database (http://www.cancerantiquity.org/crabdatabase); a global summary of the published evidence of ancient cancer in humans and early hominins as well as the methods used in these studies. This database was created by Kathryn Hunt for her Masters degree at Durham University, then verified, further refined and published online with the assistance of the Palaeo-oncology Research Organization's executive team, including the current speaker. Results of an associated article (Hunt et al., 2018), co-authored by the current speaker, are also briefly discussed with regard to the state of the art of palaeo-oncology to date, its limitations, and the need for more multidisciplinary collaboration.

In addition to methodological progress, the role of recent theoretical breakthroughs in the advancement of palaeo-oncology are also discussed in relation to the potential for further discovery in this field. Looking to the future, the unfulfilled potential of palaeo-oncological research is noted, along with its ability to contribute to our collective scholarly understanding of cancer and neoplastic disease in manners not possible through clinical studies.

THE FIRST MODERN OLYMPIAD AND THE INTRODUCTION OF RADIOLOGY IN GREECE. Dimitrios Kardamakis, University of Patras, Greece.

Two major events in the history of the Modern Greek State relate to the introduction of Radiology in clinical practice; the first, was the revival of the Ancient Olympic Games and the hosting by the city of Athens of the First Modern Olympiad, in 1896; the second was the disastrous Greco-Turkish war of 1897.

Discovery of X rays, 1895. Wilhelm Conrad Roentgen (1845-1923), a German professor of physics, observed that certain rays were emitted during the passing of electrical current through a vacuum tube which illuminated a barium platinocyanide covered screen. He captured on photographic plate the image of various objects of random thickness placed in the path of the rays and he generated the very first ever "roentgenogram" with the image of his wife's hand. The date was November 8th, 1895; he was honored with the first Nobel Prize in Physics, in 1901.

In 1895, the front page of the Athenian newspaper *Acropolis* announced that an *important discovery* "*σπουδαῖα ἀνακάλυψις*" had taken place, whilst the local Patras newspaper *Neologos* exulted the *announcement of a new discovery that opened a new epoch in the history of humanity*. "*Νέα ἀναγγέλεται ἐφεύρεσις ἥτις θὰ ἀποτελέσει ἐποχήν ἐν τῇ ἱστορία τῆς ἀνθρωπότητος".* In Greece, the first X ray images were taken in March 1896 by Timoleon Argyropoulos, professor of Physics at the University of Athens. However, none of these images were obtained for medical reasons. Although in the public mind the introduction of radiology in Greece is linked with the 1896 Olympic Games and the need to provide the athletes with the latest and most advanced medical facilities at that time, in reality, Greek physicians did not adopt the method until later, mainly because of financial hardships of that period. In May 1897, the first X-ray medical apparatus was donated by a British charity to Greece for the needs of the Hellenic-Ottoman war. The new equipment was viewed with suspicion by some religious combatants who refused to be examined, until a bullet was imaged deep in the body of an injured soldier. The same year, 1897, another wealthy benefactor, **D. Kollas**, donated the first X-ray apparatus to the Town Hospital of Patras, in Western Peloponnese. It was during the Greek-Ottoman war of 1897 that X-rays were used for diagnostic purposes for the first time in Greece but also, near a battlefield in mobile military establishments, allowing the radiologic pioneers to evaluate the usefulness of radiography close to the firing line. The slow evolution of diagnostic radiology and radiotherapy in Greece, is in sharp contrast with the rapid development these days of interventional radiology which is now routine and constantly evolving in several hospitals of Greece.

THE ORIGINS AND EVOLUTION OF INTERVENTIONAL RADIOLOGY IN ONCOLOGY. Miltiadis Krokidis, Cambridge, UK.

Interventional Radiology was born in January 16, 1964, when Charles Dotter from Portland, USA, percutaneously dilated a tight, localized stenosis of the superficial femoral artery (SFA) in an 82-year-old woman with painful leg ischemia. In 1968, he reported on 217 dilations in 127 patients. The term "Interventional Radiology" was coined by Margulis AR, in the March 1967 issue of the American Journal of Roentgenology. The angiographic diagnosis and treatment of acute gastrointestinal bleeding was pioneered by Nusbaum and Baum, in 1963 and in 1970 Joseph Rösch introduced the selective arterial embolization with use of autologous clots for the treatment of gastrointestinal bleeding (Rösch J., *et al*, 1972).
Ten years later the use of absolute ethanol for the palliative intraarterial embolization of renal tumours was published in six cases with massive haematuria (Ellman BA, *et al*, 1981). The ablative effect of ethanol was soon adopted for percutaneous use under ultrasound guidance, and Luigi Solbiati was one of the first that used this technique mainly for tumours that were considered inoperable or after surgical recurrence (Solbiati L, *et al*, 1985).
Further technology was gradually adapted in the percutaneous treatment of tumours and in particular, Radiofrequency Ablation (RFA). Interestingly, the technique was described over a century ago by D'Arsonval, who, in 1891, first demonstrated that when RF waves passed through tissue, they caused an increase in tissue temperature. In 1993 this technique was used for the treatment of liver (McGahan JP *et al*, 1993) and in 1997 kidney tumours in humans (Zlotta AR, *et al*, 1997).
The concept of treating liver malignancy by occluding its blood supply was introduced in the 1950s (Markowitz J., 1952) and continues to be the basis of trans-arterial embolization in the treatment of unresectable disease (Doyon D, *et al*, 1974). In this procedure, an embolizing agent is administered via an intraarterial catheter with the goal of completely occluding the tumour-feeding arterioles. Trans-arterial chemoembolization with use of anticancer drugs followed by biological sponge was introduced by Yamada *et al* in the late 1970s. The concept of chemoembolization is to administer a potent chemotherapeutic agent into the hepatic arteries supplying the tumour. This is followed by embolization of the target vessels. Chemoembolization with drug-eluting beads represents a relatively new mechanism of enhancing the delivery of potent anticancer agents to the site of the tumour. The concept of drug-eluting beads is to load polyvinyl alcohol–based microspheres with various types of chemotherapeutic agents and deliver them intraarterially in a manner similar to that of conventional chemoembolization. An example of drug-eluting beads is the doxorubicin-capable bead, or DC bead. DC beads can be loaded with doxorubicin to 25 mg/mL on hydrated beads by immersing them in a drug solution for 1 to 120 minutes (Lewis AL, *et al*, 2006).
Radioembolization is defined as the injection of micron-sized embolic particles loaded with a radioisotope by using percutaneous trans-arterial techniques. Although first used in human subjects in the early 1960s (Ariel IM, 1965), only within the past decade has it gained increasing awareness and usage (Salem R, Thurston KG. 2006).
Radiology via the significant advances in imaging technology and minimal invasive therapies has evolved in the last 30 years from a purely diagnostic, to a therapeutic speciality for patients with cancer.