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MUSEUM-HALL OF KNOWLEDGE AND CURIOSITY –A STUDY OF COMPARISON AND CORRELATION

Anatomy

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ABSTRACT

Introduction: Museum is the hall of knowledge disseminated through specimen,charts etc . collected,preserved,and exhibited for the benefit of public and students of Medicine.

Aim of the study: It is to showcase the museum of Anatomy often referred as 'Hall of curiosity' depicting the various scopes of the subjects right from the history ,evolution,development within womb,& after birth .It also vastly enhances knowledge related to cross sectional studies ,Genetics, Teratology and Clinical Anatomy to later help the students of Medicine

Materials & Methods: The dissected specimens from human cadaver ,charts,bones,,models,and radiological images of various modalities constituted the materials for the present study.

Observations: These materials are well arranged and mounted under different sections.

Conclusion: The presence of museum in medical colleges is of great importance which creates interest in the subject amongst the students as well as creates inquisitiveness about what forms human body amongst the general public

KEYWORDS

Wet Specimens: Charts:Hall of Curiosity,Models:Articulated skeletons: Bones

INTRODUCTION:

Alexander and Alexander defined museum as follows “an institution that houses and cares for collection of artefacts and objects of scientific,artistic,or historical importance and make them available for public viewing through exhibits that may be permanent or temporary"[1] In the early part of 17th century, the word Museum was first derived from the Greek word “Mouseion “meaning “Seat of the Muses”..In Greek mythology the muses are divine patron of arts divinities[2].Anatomy comes under category of “Science Museum". An anatomy museum is very important to teach Anatomy to the students of Medicine as well as for the general public. Anatomical science showed significant development during 1300-1500 which is said to be late middle ages in Italy **[3].**

Mondino de Liuzzi in 1316 wrote ,printed and published a manual of Anatomic Dissection for the first time in history[4].In Europe between 1500-1800 ,Anatomic knowledge was further expanded based on dissection of human body, and through books engravings on copper plates, lectures and demonstrations in the Universities ,libraries , and museums**[3]**.Leonardo da vinci[1452-1564] & Michelangelo [1475-1564] were most famous artists during Renaissance period**[3]**..Meraldi[2000] has stated the oldest museum is Museum of Human Anatomy belonging to University of Bologona**[5].**In 18th century robbery in the graves was going on in many developing countries as stated by **Ochani et al [2004][6]**

CONCEPT OF ANATOMY MUSEUM: There was evolution of anatomical illustrations & wax modeling in Italy from 16th to early part of 19th century**[7].**In 17th century a dissection cabinet was first established containing prepared specimens**.[3]**.Anatomy museums were present way back in the year 1699-1763 when surgeons of Edinburgh decided to have collections of books pictures and numerous anatomical specimens which they called 'Cabinet of curiosities.'**[8].**In those days in the museums they exhibited wax, clay, ivory and wooden carved models which was collectively called as ***"Anatomical manikins"***.There was great collection of anatomical wax models by La Specola collection in Florence.**[9]**This was done in 1775, where they had exhibited life size female statue called "Medical Venus “ which showed body structures. Even muscle mass, biological systems and cross sectional specimens were included. **Chaplin [2005]** reported that in 18th century, there was Anatomical collections by John Hunter at his residence cum Anatomy school between 1783-1793 at London's Leicester Square**[10].**French graduate Physician **Louis Thomas Jerome Auzoux (1797-1880)** prepared models of men, animals, flowers and models of body structures which were sold in the market for educational purposes.**[11].** Wax modeller **Gaetano Giulio Zumbo** and the French surgeon **Guillaume Desnoues** prepared first coloured wax models in the late seventeenth century .The quality of colored wax models was much better than those prepared from wood, marble or clay**.[12].A teaching museum** for students of medicine and to general public was opened in Scotland and was considered one of the oldest museum in 1832**.[13].**

MODERN MUSEUMS: As stated by Heylings ,Anatomy museum of Belfast was established in 1835.This museum has two separate rooms for preservations of bones[osteology specimens] & wet specimens. A separate section for Radiology & one to exhibit portraits of past professors exists[14].According to article written **by Kemp and Galenakis** [2011],Professor George Rolleston (1829-81), the first anatomy and physiology Professor of the University had great collection of ancient Greek skulls in Oxford University Museum.Many hundreds of skulls have been collected and preserved**.[15].**By 1600 ,Fabricius had collected more than 300 paintings,and made a famous atlas of Anatomy known as *Tabulae Pictae.*They had described museum of Anatomical waxes at the Univrsity of Cagliari .in Italy**[3]**.An article written by **Esposito and Chipparo** on history of Anatomy portrays the Anatomy museum in Naples established by famous Anatomist & surgeon by name **Marco**

Aurelio Severino in 17th century**[16].Hopwood[2007]**in the mid nineteenth century wrote an article **"Artist versus Anatomist,Models versus Dissection".** .**Paul Zeiller** was a modeler who believed that models could save the cadavers from the dissections. He campaigned against dissection **and** 'Knife Anatomy" between 1860-1870s**[17].Gere [2003]** wrote an article entitled "**A brief History of brain archiving"** and did a work on advances of brain specimen and their study from 18th centaury to 20th century. This article tells about history of early techniques of preservation to modern cryogenic technology**[18] .**

Montenegro et al [2006] have described a museum established in 1920 which houses 1211 museum specimens at National University of Cardoba ,Argentina. This exhibits specimens from embryonic stage to old age .Professor **Pedto Ara** has made great contribution, one of which is of high quality **'Old man's head '** between 1828-1829.**[19].Basmijian in 1961** wrote an article on role of Anatomy museums in educating the students of medicine and general public. He conducted a survey in Kingston, Canada and suggested that Anatomy museum played major role in scientific education. This survey made awareness in the Medical Universities .in order to have a very good anatomy museums**[20].Marreez et al [2010]** also stressed the importance and role of Anatomy museums in medical education. The article written on museum has stated that, currently the most two modern museums are **Anatomy museum of Leiden Medical University in Netherlands** and the other museum at **Kawasaki Medical School, Japan**. Both are equipped with Advanced Information Technologies and Audio visual Aids for the purpose of education**[21].**

Criteria for making museum as contemporary Museum:

Museum should have following special sections.,

A]Comparative Evolutionary Anatomy: It compares human Anatomy with that of other species,thus comparing the evolution of species ,viz a viz the **Homo sapiens.**

B]History of Anatomy: It depicts the eminent Anatomists & notable contributors in this field,.apart from this ,it does throw light on famous modelers, discovery of formalin ,the enactment & implementation of the Anatomy act

C]Embryological Section: Early developmental changes occurring in the fetus/embryo are illustrated through models, specimens,& sketches. These are shown system wise as well as time related developmental changes in days, weeks,& months.

D] Cross sectional Anatomy: These are shown by making various sections of the body & body parts ,example-Saggital,,coronal,& horizontal sections & correlating it with the cross sectional images of C-T Scans& MRI. Thus cross sections of the limbs ,thorax, abdomen & pelvis are displayed. at various levels.

E] Bio mechanics: By means of bio mechanic models physiological functions of the kidneys, heart and lungs can be explained. Models can be prepared with the help of Anatomists,,physiologists and Technicians.

F]**Section of Teratology :** Teratology is the study of congenital anomalies .Specimens can be collected from the labour ward or from any surgical operations , fixed by formalin and then preserved,displayed & photographed.

G**] Section of odontology**: The science that deals with teeth is called as odontology.This section can be included to display various aspect of anomalies of teeth, and nutritional defects.

H]**Section of clinical Pathology or clinical Anatomy**:Here in this section specimens of pathology are to be displayed,.In this section both normal as well as pathological specimens have to be displayed to study anatomy of particular organ both in normal and pathological conditions for comparison and for correlations

J]Section of genetics :This section chromosomal studies and congenital anomalies can be studied by using charts & pictures.Models of chromosomes and DNA can be prepared and studied.Charts of various chromosomal abnormalities eg., Down's syndrome and Turner's Syndrome can be shown to the students and to the general public to create awareness of the syndromes.

K] Section of Osteology: Bones of both fetus as well as adults can be kept in the museum for the purpose of study .Articulated skeleton can be kept in the museum to have a comprehensive overview

L]Radiology section: Special Imaging modalities films like C-T scans, MRI, angiograms , can be kept in museum along with normal X-Rays to show for students & also for visitors.

M]Mummified Bodies: of man can be kept in the museum to create curiosity amongst the visitors and for the purpose of surface markings study on human bodies.

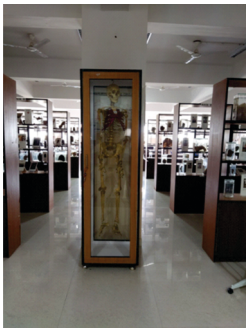
N] Plastination: Parts of human body ,limbs or whole body can be plastinated .and kept in the museum for purpose of study.

Our Anatomy Museum at Jaipur National university Institute for Medical Sciences & Research Center:[JNUIMS&RC]: Has the following in display :

1]Wet specimens with photographs.....197
2]Charts displayed in the museum and dissection hall.....183.
3]Articulated skeletons.....07.
4]Disarticulated Bones 22
5]Number of skeletons kept in wooden box with glass door.....02
6]Number of Models.....103.
7]White board for Teaching purposes.....02
8]Clip board 02
9]Digital camera with microscope.....01
10]Congenital anomalies specimens-Anencephaly, Omphalocele, Hydrocephalus.....03
11] Chick embryo embryological slides [one set of slides in various stages of development].....10

Specimens have been dissected carefully. preserved ,mounted labeled and photographed. Photos are kept by the side of respective specimens .These specimens are arranged according to the regions of the body namely thorax, abdomen and pelvis ,head and neck , limbs [extremities] & Neuro Anatomy specimens. Disarticulated bones are painted in red and blue color and then mounted on the wooden stand, labeled and arranged according to region wise. Embryology models are arranged separately with the headings below .Two articulated skeleton have been kept one in the museum and the other in dissection theater for purpose of study.Our museum also has adequate space equipped with tables and chairs for purpose of study by students. White teaching boards have been kept for the purpose of teaching the students and for demonstrations. So we have space both for teaching purposes and simultaneously for demonstrations of specimens to students..Also we have 15 copies of pictorial catalogues in colours that has been displayed in the museum .Pictures of every specimens have been stored in the computers so that they can be shared by the students.

1]PHOTOGRAPH SHOWING ARTICULATED SKELETON KEPT IN THE RACK

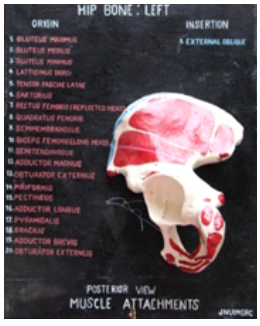


2] PHOTOGRAPHS SHOWING SPECIMENS DISPLAYED IN THE RACK

RESEARCH LABORATORY

Midsagittal section of Head & neck

Midsagittal section of Brain



Hip Bone

DISCUSSION:

In 1955,International Council of Museum[ICOM] defined Museum in their meeting as follows *"Permanent organization in the service of the society & its development ,open to public ,which acquires, conserves researches, communicates & exhibits the tangible heritage of humanity & its environment for the purpose of education, study & enjoyment".*Again in 1962, meeting ,ICOM has focused on mission of education and redefined it as follows ***"Permanent organization that preserve and exhibit collections consisting of objects with cultural and scientific values for research,education & enjoyment purposes".[Atik :2009:1 20].***

Sozen and Tanveli defined museum as follows ***Organizations opened to the public established to exhibit artistic,cultural,historical ,or scientific artefacts permanently,or establishments that carry the properties listed above[22].*****Riviere** also stressed the importance of role of museum in education as follows *permanent organizations working for the benefit of public by carrying collections of art science ,history,health and technology to preserve, study, assess, and exhibit the cultural values as a whole in order to develop aesthetical enjoyment and education in public "* **[23].**

Today America has built new museum known as **MoMA-Museum of Modern Arts** in New York in 1929 This museum is said to be first large public museum of America .This museum houses **Greek-Roman-Egyptian artifacts** in its first floor and in the upper floors has works of period of Renaissance[**Dr Burcu Gunay-2012].**Similarly a museum was built **in France** known as **Pompidou Museum** that was built in 1977.This museum has public oriented style having public libraries, cinemas theaters, along with enormous collections. This museum has brought education, culture and art together**[24].**The present concept of todays museum has 4 important ways ,they are virtual, touchable, mobile and foundation museum. So museum has emerged as center of pedagogical, sociological and pschycological importance. Museology has emerged as separate branch in the universities, to study. It has changed from passive educational system to active educational system to promote research, analysis & synthesis with support of the libraries.**[25]**

Steps To Make Our Museum Much More Intresting:

Even though we have adequate well dissected and well preserved specimens, along with embryology models and 4 articulated skeletons kept in wooden boxes,still we can further make our museum more interesting by housing many more sections so that it can become **profound powerhouse of knowledge and curiosity.**

A**]Section of Radiology displaying both simple and contrast X-Rays** .These plates can be kept illuminated with the help of tube light underneath or rotator stand for displaying X-Rays.

B]Specimens prepared by novel techniques **like Plastinations** and by corrosion.

C]**Robotic models** to educates the students of medicine and general public especially students community of other colleges to what the human body is ..

D] **Portraits** of great anatomist, artist, modelers,& technicians of the past including **Michel angelo & Leonardo Davinci** to pay tribute for their earnest contribution.

E]**Audio visual Aids** should be kept ready for teaching purposes. and for demonstrations of various parts of the body..

F]**Visitors book** should be kept near the entrance and make them to write their opinions and suggestions.

G**]Labelling** should be done on all specimens. as done in the Department of Anatomy at **Nanjing Medical University, Republic of CHINA**

H]Encourage the students of medicine **to make use** of this museum **to learn and brush up their memory.**

CONCLUSION:

A well planned prepared,preserved Museum of Anatomy helps to disseminate knowledge both for students of Medicine and to the general public .

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