

## Human Vestigial Organs: Hidden Parts in Medical Science

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### Abstract

Vestigial organs are the troubled side of human life because occasionally we are affected some ailments like appendicitis and tonsillitis which may fatal for our life. Conversely, these diseases were very common in our ancestor. In fact, the word 'Evolution' is the most live word and controversially a rational matter to pick-up the evidences on vestigial organs of human body. Applying the theory of Lamarck and Darwin, the medical science department may run speedy for human welfare. In this regard, we may study on found evidences on human fossils. Inevitably, we should focus great emphasis on human evolution in MBBS syllabus. In addition, we should find some similar species which are occasionally affected by these diseases. In test-tube baby, it is possible to cut-down those genes of vestigial organs which are the main target of this article. Being thankful on health, we should believe how wonderful will be afterward by knowing human evolution and the structure and functions of such vestigial organs.

### Introduction

What we think on human origin, specifically it is not so easy, this is a crux matter at all. According the evidences, in human body, we have lots of vestigial organs which were ofcourse functional once a time. Human and non-human animals all have those vestigial organs whether they are functional or not

considered as connecting links. In contrast, we have missing links also. Modern research in recent years, they have discovered some functions on particular vestigial organs like appendix and tonsil. Vermiform appendix is active in herbivores animals. If any food enters inside this, by the activity of cellulose enzyme, this portion helps to digest that food particle. In fact, human have no cellulose enzyme. But it is true that in anatomical point of view our digestive tract is very long and resemble with herbivore animals. Apparently, due to geographical matters we have changed our food habit as well. Nictitating membrane or third eye lid is functional in monkeys, ear muscle is inactive in dogs, in some races of human they have no body hair or very less (comparatively female has less body hair due to hormonal function). Normally our abdominal muscles (commonly known as 6 packs) are inactive but after exercise it is possible to build-up strongly. Darwin's point/Darwin's tubercle is a sign for the pointed ear of other animals like horses, rhinos, cows, goats, donkeys etc. Interestingly, the vomeronasal bone is located in our cranium and this is inactive too. Neuroscientist Michael Meredith of Florida State University said that there is no nerve connection with this bone. So, this is totally vestigial organ of human body. On the basis of evolution or by analysing the paleontological evidences (fossil records) this is universal that 'Ontogeny Repeats Phylogeny' and atavism/through back is the common phenomenon in entire animal kingdom.

Specifically, we find measles, pox, diarrhoea, tuberculosis, and cholera in our progenitor. In this modern world, in fact, these are not diseases at all. Very effective medical facilities are available now across the world. Reginald Heber Fitz (1843 - 1913) who was an American Physician is credited first to describe appendicitis successfully. Aelius Galenus (129 AD – c 210 AD) dissected monkey and he mentioned that it has no appendix. In 1522 Berengarius Carpus (1460 - 1530), Professor of Surgery at Pavia and Bologna described the structure of appendix. Aulus Cornelius Celsus (25 BC - AD 50) in Rome who was an encyclopaedist known of his extant medical works and he removed tonsil at the first century. Famous German bodybuilder or father of the bodybuilder Eugen Sandow (1867 - 1925) developed his body with abdominal muscles (pack muscles) late 19<sup>th</sup> century. He died by stroke only at the age of 58. Priest (religious leader), Imhotep (c 2667 - 2600 BCE), he was basically an architect and wrote book on medical science. Surgery branch was the established part in medical science in 2500 BC [1]. Later on, Indian people were famous for medicinal plants and idea on genetical diseases of human being [2]. Specifically, they knew about vestigial organs in human body with their mode of infection. Some vestigial organs have been changed based on their food habit, lifestyle, and even on geography. Afterwards, for human's survival they had been habituated to cope with different climates. Classical examples are eye and limb reductions in cave dwelling or burrowing organisms. Wing reductions associated with ground dwelling, or dental or intestinal reductions attributable to changes of diet. In many cases, the vestigials are present only in fossil forms and are completely lost in extant representatives. In other cases, the rudiments are present only in the embryo or juvenile and are completely lost in the adult (teeth of the embryos of baleen whale) [3]. Till now, after dissecting human body we have seen 86 vestigial organs (Robert Wiedersheim, 1848 - 1923) in total. Certain vestigial in human are of medical significance as exemplified by Para ovarian cysts, branchial fistulae, or appendicitis [4]. Vestigial organs appear to be useless and not only presented as evidence for evolution, but as evidence against creation, because no intelligent creator would make useless organs. We need no longer five things—coccyx, goose bump, wisdom teeth, vomeronasal organ, and Darwin's point and among these vomeronasal organ and Darwin's point are obscure in human body. Renowned magazine 'New Scientist' claimed that there were more than 100 medical reports of babies born with tails and 35% people have no wisdom teeth.

Loss or decreased growth of structure is the opposite of evolution. Darwin's point is occurred in approximately 10% in humans. Evolution is a process that requires simple creatures to gain new structures and functions and become more complex [5]. Darwin said, the nature of all living and extinct beings are united by complex, radiating, and circuitous lines of affinities into one ground system, as in rudimentary organs, of no importance; the wide opposition in value between analogical or adaptive characters, all naturally follow on the view of the common percentage of those forms which are considered by naturalists as allied, together with their modifications of vestigial organs through natural selection, with its contingencies of extinction and divergence of character [6]. The objective of this study is, at first to find out more information on vestigial organs from the evolutionary point of view and then find out some links of diseases and finally ensure better treatments of mentioned diseases of human being.

### **86 Vestigial Organs of Human Body (Wiedersheim, 1893) (Source: Internet)**

1. Os coccygis. Cauda humana
2. Superfluous embryonic notochord and associated somites
3. Embryonic cervical, lumbar, and sacral ribs
4. The thirteenth rib of the adult
5. The seventh cervical rib in the adult
6. The interarticular cartilage of the sterno-clavicular joint (probable vestige of the episternal apparatus)
7. Ossa supra-sternalia
8. Certain centres of ossification in the manubrium sterni
9. The branchial clefts (for the most part) and branchial ridges
10. Processus styloideus ossis temporis, and the ligamentum stylohyoideum
11. Anterior cornua of the hyoid, for the greater part
12. Foramen caecum of the tongue
13. Processus gracilis of the malleus
14. Post-frontal bone (?)
15. Ossa interparietalia (and ? preinterparietalia)
16. Processus paramastoideus of exoccipital
17. Torus occipitalis
18. Processus frontalis of the temporal
19. Processus coracoideus [meta- and epi-coracoid bones]
20. Os centrale carpi
21. Processus supracondyloideus humeri
22. Trochanter tertius femoris
23. The phalanges of the fifth toe, and less conspicuously of the third and fourth toes
24. Muscles of the pinna and the Musculus occipitalis L.
25. M. transversus nuchae L.
26. Facial muscles transformed into tendinous expansions
27. Mm. plantaris and palmaris longus, when completely tendinous
28. M. ischio femoralis
29. The caudal muscles

30. M. epitrochleo-anconaeu
31. M. latissimo-condyloideus
32. M. transversus thoracis (triangularis sterni)
33. M. palmaris brevis
34. The transition bundles between the trapezius and the sterno- cleido-mastoideus
35. M. levator claviculae
36. M. rectus thoracis
37. M. cremaster
38. The primitive hairy covering or lanugo
39. Vestiges of vibrissae
40. The vertex coccygeus, the foveola and glabella coccygea
41. Certain vortices of hair on the breast
42. Nipples in men
43. Supernumerary mammary glands in women
44. Alleged vestiges of mammary pouches [?]
45. Supernumerary olfactory ridges
46. Jacobson's organ, and ductus naso-palatinus
47. Papilla palatina and foliata
48. Plica semilunaris of the eye
49. Vasa hyaloidse (Cloquet's canal) of the embryo – the choroidal fissure
50. Lachrymal glands, in part
51. The epicanthus
52. M. orbitalis
53. Certain varieties of the pinna of the ear, i.e. Darwin's tubercle
54. The filum terminale of the spinal cord
55. Glandula pinealis and parietal organ
56. The parieto-occipital fissure of the brain [doubtful]
57. The obex, ponticulus, ligula, taeniae medullares, and velum medullare anterius and posterius, of the brain
58. The hypophysis cerebri (pituitary body)
59. The dorsal roots and ganglia of the hypoglossus nerve
60. The rami recurrentes of certain cranial nerves
61. Certain elements of the brachial and lumbo-sacral plexuses
62. The coccygeal nerve
63. The glandula coccygea
64. Palatal ridges
65. The sublingua
66. The formation of rudimentary dental papillae before the sinking of the dental ridge
67. The Wisdom teeth
68. The occurrence of a third premolar (reversionary)
69. The occurrence of a fourth molar (reversionary)
70. The vestiges of a third dentition

71. The ciliated epithelium of the embryonic oesophagus
72. Bursa sub- and prehyoidea (ductus thyroglossus)
73. Musculi broncho-oesophagei
74. The appendix vermiformis
75. Ventricle of the larynx (Morgagni's pouch)
76. Lobus subpericardiacus of the lung (reversionary)
77. Certain valves of the veins
78. Certain structures of a vestigial nature in the heart
79. Arteria sacralis media
80. Arteria ischiadica
81. Superficial plantar arterial arch of the foot
82. The vena cava superior sinistra
83. Venae cardinales posteriores, and ductus Cuvieri
84. Vestiges (in female) of the mesonephric system, and (in male) of the Müllerian ducts
85. Conus inguinalis, and ligamentum inguinale
86. The area scroti

## Two Rival Theories on 'Genetics' and 'Evolution' Which are Linked With Vestigial Organs of Human Body

Lamarck (1744-1829) mentioned his theory on 'Inheritance of Acquired Characteristics' where he strongly tried to focus the use and disuse of organs of the organisms. Darwin (1809-1882) studied this theory and explained his 'Natural Selection' theory. Both theories have some merits and demerits also. Lamarck said that continuous practice for taking food some organs may increase in animals and use and disuse may establish that portions and for long time desire these may pass through genes. Darwin mainly focused only on 'Natural Selection' not on genetics. Whatever, which is correct or not this is not mandatory but it is true that when we will know all about that vestigial organs, possible to overcome their infections. Then, we should set more theories (strong set of ideas) with this study.

## Following Evidences are Linked to Our Diseases of the Vestigial Organs

**Embryological:** The main criterion in this section is 'Ontogeny Recapitulates Phylogeny' (Ernst Haeckel, 1834 - 1919). Each embryo always indicates its origin. Interestingly, all embryos are same look at the first stage.

**Morphological:** By this section, we can understand the comparative study between and among of organs (from lower to higher). In addition, homologous and analogous organs should observe here.

**Physiological:** The physiological activities are same in different organisms.

**Biochemical:** From lower to higher organisms, various chemicals are same on its origin and functioning properties.

**Geological:** We have found lots of fossils of human. Therefore, if we arrange this gradually, it is very optimistic for understanding various organs of human body.

**Geographical:** In this modern world, if we see some race in African territories, this is very obvious to observe various differences in our lifestyle. These variations influenced us to take different food from the different localities.

**Genetical:** Study on our family history, we overcome some genetical diseases. Infection of vestigial organs like appendix and tonsil are very sensitive in some families. Though there may links to their lifestyle and food habit. However, in this regard, study on genealogy is important.

**Cytological:** At first, we should study on cellular level of any organs of human body.

**Taxonomical:** This branch always indicates our similarities and dissimilarities along with other animals. Interestingly, some domestic animals are more prone to facing diseases which are common in human.

## Concluding Remarks

Likewise, by the evolutionary study we can discover the nature of human body which may help for the progress of diseases with their treatments also. If we can deduct the genes for the problems in vestigial organs at the test-tube level our next progenies will free from such ailments. Actually, we can include the course on evolution and mutation theory in MBBS syllabus where Lamarckism and Darwinism will fulfil the demand of vestigial organs of human body. Though there are evolutionary evidences like embryological, cytological, histological, biochemical, physiological, genetical, geological, geographical, morphological, and taxonomical. So far I know a medical student just read out about human anatomy and common physiology but not evolution elaborately. A zoologist preserves adequate knowledge on this not only in human but also in other animals. Specifically, for human welfare the study on evolution with genetics in medical syllabus may carry better treatments not only on vestigial organs but also other ailments. In our ancestor some had abdominal or pack muscles though they were not habituated in so-called exercise but they were industrious also. For the time being, people are being habituated to pass luxurious lifestyle and for modern equipment's they are not performing physical labour so that they have gained overweight which leads obesity finally. Recombinant DNA technology, human genetic code, and test-tube baby may overcome some fatal diseases of vestigial organs. If test-tube adults are married to each other, their children will not carry such genes of the diseases. Afterwards, if they only maintain their some secondary phenomena like food habit and lifestyle, of course, apparently, will hold a disease-free life as well.

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