Chronicle of Corneal transplant

Saleh Saif AL Messabi FRCS (CANADA)
Samaya Eye Hospital, UAE
timeline

- ancient history
- 1800 (trials and errors)
- 1905 (first successful human PKP)
- 1990 Lamellar Reawaken
1905 marked the first successful human allograft by Eduard Zirm in Olmutz near Prague.
Concept of Transplantation (Ancient Greeks): Mythical monsters woven from the various parts of different animals. The most spectacular of these creatures is Chimaera.
• **130 - 200 AD:** Original concept of corneal transplantation is attributed to the Greek physician Galen.

• **Abrasio cor’naea** (precursor of superficial keratectomy): Galen proposed it as a means of restoring corneal transparency.
Guillaume Pellier de Quengsy: The first description of a Keratoprosthesis is attributed to this French surgeon 1789

- first Ophthalmology monograph

- can a transparent material could be used to replace an opaque cornea in order to restore vision?
• Erasmus Darwin (Grandfather of Charles):

• proposed first corneal trephine 1796

• “Could not a small piece of cornea be cut out by a kind of trephine, about the size of a thick bristle, or a small crow quill, and would it not heal with a transparent scar?” (Erasmus Darwin, Zoonomia, or the laws of organic life)
• Epidemic of blinding Egyptian ophthalmia (trachoma) forced progress in corneal transplantation.

• Trachoma was responsible for the establishment of ophthalmology as the first of the surgical subspecialties. It provided the stimulus for the foundation of Moorfields Eye Hospital, London in 1817.
animal exenograft

between 1813-1837 himly and his student reisenger reported grafts among animals and coined the term keratoplasty
where was the first successful animal PKP done?

1837 Samuel Bigger, irish ophthalmologist captured for Ransom near Cairo

he noted: ‘The cornea was taken from another animal of the same species brought in wounded but not quite dead; adhesion took place and 10 days after the operation, the animal gave unequivocal signs of vision, and the upper part of the transplanted cornea remained perfectly transparenta
Richard Kissam: This New York based ophthalmologist performed the first recorded therapeutic corneal xenograft on a human in 1838. *(Recipient: young Irishman, Donor: 6-month-old pig)*
Arthur von Hippel (1841-1916): Developed a number of graft instruments including a clockwork trephine, advocated lamellar xenografts.

Von Hippel promoted lamellar grafts as he believed that corneal transparency depended on the integrity of the endothelium and Descemet's membrane.
Henry Power: This English ophthalmologist favoured allografts. He believed that allografts had ‘better matched thicknesses.’

Xenografts vs Allografts: Remainder of the 19th century, the pioneers of corneal transplantation were divided based on it.

Power favored penetrating keratoplasty.
1905 marked the first successful human allograft performed by Eduard Zirm
Zirm Recommendations

- exclusive use of human corneas (preferably from young and healthy donors),
- use of the von Hippel trephine,
- deep anesthesia, strict asepsis
- overlay sutures, use of an AC maintainer
- special precautions in tissue handling
Russian ophthalmologist Vladimir Filatov (1875-1956) supported the use of cadaver corneas 3500 PKP in his career.
1944 Dr. Paton
First Eye Bank in USA
ANOTHER MEDICAL MILESTONES HELPED IN THE SUCCESS OF CORNEAL TRANSPLANTS
G.A in 1846 in Massachusetts

principles of antisepctics in 1867

1940s increase antibiotics availability

1951 Corticosteroids in animals

1953 Zeiss first commercial microscope

1968 Ethicon 10-0 nylon suture
around 1990

the war revolve lamellar vss pkp:

in Anterior lamellar surgery:

1986 Archilla describe DALK by intrastromal air inj

2003 Anwar DALK big bubble technique
posterior lamellar surgery:

- 1998 Melles reports Endothelial keratoplasty
- 2004 Price DSEK
- 2004 MELLES DMEK
where are we now?

- ant and post lamellar
- femto second
- artificial or bioengineered tissue
- keratoprosthesis
- endothelial cells transplant
Johan Dieffenbach (1792-1847) and after many failure with animals grafts said:

- ‘one of the most audacious fantasies’

- ‘would be the highest reward of surgery if this operation succeeded’
the questions to you:

what if we stopped there?

and now what will be said later about corneal transplant?
Thanks for your attention!