Introduction
Rowe and associates in 1953. The adenovirus is isolated from adenoids originally. Adenovirus shares a common complement-fixing antigen. The virus infects humans, birds, and animals, and infections are most common in children.

Morphology
It is a non-enveloped, icosahedral symmetry, linear Double-stranded DNA virus. The size of a virus is 70-90nm and contains 252 capsomers and 240 hexagons. The virus has 12 fibrillar pentons, and it was space vehicle shaped appearance.

Resistance
It is a heat-stable virus and readily inactivated at 50°C. They resist ether and bile salts.

Epidemiology
It is an endemic disease and is transmitted through droplets, Direct contact, Feco-oral transmission. Its 1/3rd of human serotypes cause human illness.

Virus effects on cells:
It saws in marked rounding, enlargement, and aggregation of affected cells which are grape-like clusters. Rounded intra-nuclear inclusion containing DNA present in the cells.

Pathogenesis:
- It generally causes infection of the respiratory tract, eye, GIT & UTI.
- Infection occurs through conjunctiva or nasal mucosa.
- Children- fecal-oral transmission.
- Incubation period: 5-7 days
• Multiply initially in the conjunctiva, pharynx, or small intestine and spread to draining L.nodes
• Serotype 1-8 most common
  • Subgenus (SPS) C – Acute febrile pharyngitis
  • Subgenus B – Acute respiratory disease
  • Serotype 40 and 41 – infantile gastroenteritis
  • Serotype 8, 19, 37 – eye infection
  • Serotype 19, 37 – genital infection
  • Serotype 3, 4, 11 – acute follicular conjunctivitis

**Immunity**

• Induces long-lasting immunity
• Maternal antibodies protect infant

**Lab Diagnosis**

**Specimen**

• Throat swab
• Nasopharyngeal aspirates
• Bronchial lavage
• Conjunctival swab
• Corneal scraping
• Urine
• An anal swab
• Genital secretions
• Feces, recta swab, and biopsy
Microscopy:

- Virus particles in stool by EM
- Virus isolation:
  - Primary human embryonic kidney cell line and A549 cell line.
  - HEP-2, HeLa, and KB cell lines

Viral growth:

- Can be detected through the Cytopathic effect: Rounding and grape-like clustering of swollen cells.
- Antigen detection by Direct-IF test.
- Shell vial technique
- Explant culture: It can grow on adenoid explants. However, it is no longer in use now.

Serotyping

- By Hemagglutination test and Neutralization test
- PCR for the gene coding for type-specific antigens, More sensitive and rapid.

Direct–IF test

- Detect the adenoviral antigens from clinical samples such as the throat or conjunctival secretions by using
  - fluorescent-tagged anti-hexon antibody
- Fastidious enteric serotypes such as 40 and 41 from stool: Can be detected by EM or by antigens detection by ELISA
- Serum antibody detection:
  - CFT
  - Neutralization test
  - ELISA
• HAI (Hemagglutination inhibition test) - for few hemagglutinating serotypes.

CLINICAL FINDINGS:
• Pharyngitis - acute febrile
• Pneumonia
• Conjunctivitis - Acute follicular conjunctivitis, Epidemic keratoconjunctivitis
• Infantile Gastroenteritis
• Acute hemorrhagic cystitis

DIARRHEA
• Enteric type adenovirus - serotypes 40, 41
• Not grown in routine cell culture
• Trypsinised MK cells or transformed HEK cells
• Can be identified by stool ELISA

Prevention and control:
• Hand washing
• Chlorination of swimming pools
• Environmental surfaces disinfected by sodium hypochlorite
• A live vaccine to 4, 7 - applied to military recruits

Transformation of cells
• Heubner reported types 12 and 18 produced sarcoma in baby hamsters - 1962
• Types 12, 18, and 31 - induce tumors only in animals.
• In culture, all types of cells transform