## **Review in Pathology**

**CELLULAR ADAPTATIONS** 

**Definition:** They are defined as adaptive changes taking place in a tissue or an organ secondary to altered physiological stimulation.

# Hyperplasia

- ➤ **Definition:** It is defined as an increase in number of cells in a tissue or an organ leading to increase in its size.
- > Types
  - Physiological hyperplasia—e.g. hyperplasia of breast ducts and lobules during puberty and lactation, hyperplasia of uterus during pregnancy
    - Pathological hyperplasia—e.g. benign prostatic hyperplasia (**Fig. 42**), endometrial hyperplasia. (**Fig. 47**)

➤ **Definition:** It is defined as an increase in size of cells in a tissue or an organ leading to increase in its size.

## > Types

**Hypertrophy** 

- Physiological hypertrophy—e.g. hypertrophy of skeletal muscles due to repetitive workouts in gymnasium
- Pathological hypertrophy—e.g. left ventricular hypertrophy due to systemic circulation overload.

#### Causes

- > Increased demand
- ➤ Increased hormonal stimulation
- Decreased nutrients
- > Chronic physical or chemical irritation.

# Metaplasia

- ➤ **Definition:** It is defined as reversible transformation of one cell type into another cell type secondary to chronic irritation.
- > Types
  - Columnar to squamous metaplasia, e.g. bronchial epithelium due to chronic irritants present an cigarette smoke
  - Squamous to columnar metaplasia, e.g. Barret esophagus (Fig. 1)
  - Connective tissue metaplasia, e.g. Myositis ossificans.

### Atrophy

**Types** 

- ➤ **Definition:** It is defined as shrinkage in size of cells by loss of intracellular organelles leading to shrinkage of organ.
- > Types (based on cause)
  - Disuse atrophy—e.g. skeletal muscle atrophy secondary to immobilization in cast following fracture
  - Denervation atrophy—e.g. atrophy of muscle secondary to nerve injury supplying it
  - Ischemic atrophy—Atrophy of an organ secondary to diminished blood supply
  - Nutritional atrophy—e.g. atrophy of skeletal muscles due to protein energy malnutrition
  - Senile atrophy—e.g. atrophy of breast after menopause
  - Endocrinal atrophy–e.g. atrophy of uterus and breast after menopause
  - Pressure atrophy—e. g. A tumor compresses the surrounding organ causing its shrinkage.