Summary and Conclusion

Tissue engineering has been a topic of extensive research over the last years . The ability of human body to regenerate tissue loss such as bone , cartilage , nerves , skin and muscle is limited leading often to amputations of limbs or functional disability . The isolation of mesenchymal stem cells (MSCs) and later the embryonic stem cells in conjunction with the advances made in cellular biology , tissue engineering , genetics and recombinant technology has initiated the development of new techniques and new therapeutic strategies allowing treatment of many pathological conditions providing restoration of tissue continuity and function .

The three sources of mammalian stem cells are : embryonic from blastocysts , adult stem cells , which are found in adult tissues , and cord blood stem cells , which found in umbilical cord . In a developing embryo, stem cells can differentiate into all of the specialized embryonic tissues .In adult organisms , stem cells and progenitor cells act as a repair system for the body , replenishing specialized cells .

As stem cells can be readily grown and transformed into specialized cells with characteristics consistent cells of various tissues such as muscles or nerves through cell culture , their use in medical therapies has been proposed .In particular , embryonic cell lines , autologous embryonic stem cells generated through therapeutic cloning , and highly plastic stem cells from the umbilical cord blood or adult stem cells bone marrow are considered as promising candidates .

Some issues remain at the forefront of the controversy involving stem cell research – legalisation, ethics and public opinion , cost and concentration methods .

Treatment of osteonecrosis of the femoral head continues to be a challenging problem , Aseptic non-traumatic osteonecrosis of the femoral head is apainful disorder of the hip that can lead to femoral head collapse and the need for total hip replacement

Femoral head osteonecrosis most frequently occurs in young individuals , and because the results of arthroplasties for this group indicate that many patients will need to have more than one procedure in their life time so a treatment preserving femoral head instead of replacing it is preferable whenever possible .

Replacement of necrotic bone at an early stage of the disease to promote osteogenesis and angiogenesis using genetically engineered stem cells may provide better outcomes for patients with the disease .

Stem cells implantation into the osteonecrotic zone avoids the progression of the disease to the stage of the subchondral fracture (stage III) and reduced the need for total hip replacement . This new therapeutic approach should modify the treatment of early – stage osteonecrosis of the femoral head .