Various Protocols for Future Clinical Trials endorsed by ISCSG members

Protocol for Decompression and insertion of autologous stem cell insertion in AVN head of Femur

Eligibility: 18 years and above

Gender Eligible Both

Inclusion Criteria

1 Patients having history of clinical symptoms of moderate or severe pain/ stiffness with or with out limp in one or both the hips. Decrease range of motion of hip usually present.

2 Stage 1,stage 2 preferably without Collapse,diagnosed by recent MRI.

Steinberg et al proposed a 6-stage classification system based on that of Ficat and Arlet classification:

Stage 0 -(Preclinical and Preradiologic stage) Is identified when imaging is performed to evaluate AVN in the contralateral hip or to exclude other diseases. Abnormal MRI findings(A double line on T2 weighted MRI) with normal radiographic findings, and normal bone scan findings are there. Such MRI changes can also be seen in Transient bone marrow edema syndrome.

Stage 1 - Normal radiographic findings or minimal demineralization or blurred trabeculae may be there (actually it is rarely appreciated).Pain in the anterior groin or thigh is there. Limited ROM in the hip .Positive findings both in MRI & Bone scan. Some time even this stage may be asymptomatic.

Stage 2 (Reparative)- Diffuse porosis, groin pain, and *mottled sclerotic or cystic area*. First manifestation of the reparative process can be seen in this stage which is represented by generalized or patchy resorption of dead bone. This lead to appearance of small cysts with in Femoral head. Proximal ring of sclerosis can be appreciated on digital xrays. Good xray shows diffuse osteoporosis along with some sclerosis due to repair with few small cysts.At this stage patient usually come to ortho after getting xrays done

Please note that the protocol is for the furtherance of clinical trials and research based study and in no way promotes or supports any therapy to be conducted on the basis of the above protocol. Any physician / medical practitioner or any person following and using this as therapy shall be doing it at his own risk and costs.

Stage 3

- **Linear subcortical lucency, representing a fracture line (subchondral fracture/collapse=Cresent Sign)present immediately beneath the articular cortex.This is best demonstrated in Frog leg view of digital xray. Till this the femoral head preserves its round appearance but….**

- **Later mild collapse/flattening can be seen indicated by joint-space widening. Fragmentation of necrotic. area/appearance of sequestrum with in femoral head.**

NOTE: Gross collapse is not there in stage 3,mild collapse/flatenning can be appreciated and till this stage the prognosis is good. This is the last chance for ortho surgeon to treat before collapse occur.

Stage 4 (Collapse with Progressive degenerative disease)

Further flattening of the femoral head with loss of its smooth convex contour(Segmental flattening)

(Sometime the superior femoral fragment, representing the articular surface and the immediate subchondral bone become separated from the underlying femoral head) No acetabular involvment. So no decrease in Joint space.

Stage 5 -Severe collapse, flattening and destruction of the femoral head leads to progressive degenerative joint disease (DJD) with joint-space narrowing, marginal osteophyte formation (acetabular involvement.) Patient has resting pain.

3 If both hips have AVN then the most symptomatic hip will be taken first along with Radiological correlation.

4 Patients who have been treated with oral bisphosphonates earlier for AVN can be taken according to the type of the drug which is being used and then to wait for a period of six months to one year after stopping the drug.

5 Patient with history of corticosteroids intake due to any reason will be included only if the above is suspended for 1 month before the study and should also be suspended for next six months post procedure preferably. For some medical conditions if corticosteroid is very important then can be started in lowest possible doses not before 3 months post surgery.

6 Patients on alternative medicines (Homeopathic,Unani,Ayurvedic) can be enrolled but that medicine have to be stopped from the time of enrolment onwards.

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Exclusion criteria

1 Stage 3rd onwards
2 Patients with any kind of Infection specially infective arthritis
3 Diabetic Nephropathy,Diabetic Retinopathy, Cirrhosis of liver
4 Chronic Alcoholic(more than 120 ml hard liquor /day,50 ml absolute alcohol)
5 Autoimmune patients on steroid in which it can't be stopped.
6 Metabolic bone disease, Paget diases
7 Uncontrolled Diabetes.
8 Osteoporosis.
9 Malignancy
10 Positive one or all viral markers.
11 VDRL ,herpes,syphilis etc positive

Methodology

- Patient selected according to selection criteria.
- Pre procedurals Informed consent including Helsinki declaration /video consent should be obtained.
- Bone marrow harvesting and preparation of autologous MNC concentration.
- If possible Quantification of cell available in the MNC concentration by Flow cytometry for a different cell population should be done, after sending the sample to the Laboratory (a prior intimation about the expected time of sending of the sample to the lab should be made a day before). Later, the laboratory result can be accessed telephonically mean while the core decompression process is being completed.
- Core Decompression under C Arm at one or multiple sites depending on necrotic area and placement of BMMNC conc with or without scaffold.

Patient should be regularly evaluated both clinically, radiologically.
Documentation of the cell population should also be made on discharge slip.

To determine the most appropriate treatment, consider the following aspects

Age of the patient, stage of the disease (early or late), **location and amount of bone affected** (small or large area), **underlying cause of AVN** (with ongoing causes such as corticosteroid or alcohol use, treatment may not work unless use of the substance is stopped)

In some patients who had Steinberg stage III (subchondral crescent, no collapse), successful outcomes (no further surgery) have been obtained between 5 and 10 years

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