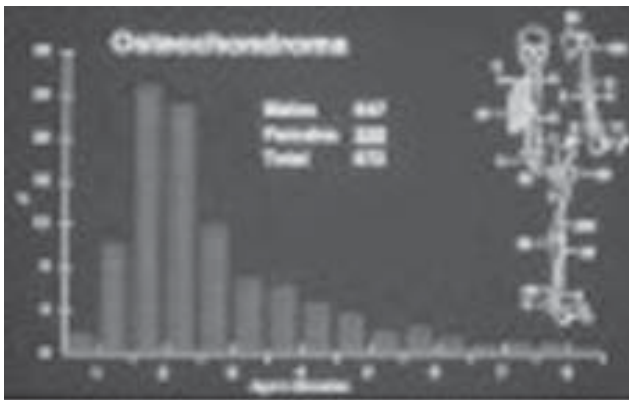


attachment and considered sessile. Whether sessile or pedunculated, the medullary canal of the stalk and the bone are in continuity. It is a hamartoma and patients most commonly present in second decade of life. Wide excision of the osteochondroma and that too at early age had lowest recurrence rate³.

The actual frequency of osteochondroma is unknown because many are not diagnosed. Most are found in patients younger than 20 years. The male to female ratio is 3:1 (Fig. 5). It can occur in any bone that undergoes endochondral ossification, but they are most common around knee^{4,5}.

There has been a lot of debate about whether an osteochondroma is a hamartoma or a true neoplasm. But, now it is considered to be a true neoplasm due to presence of loss of heterozygosity (LOH) and aneuploidy in the cartilaginous tissue of osteochondroma⁶.



(Fig. 5)

Plain radiography is the mainstay of imaging for this clinical condition. Classic radiographic features include the lesion being oriented away from the physis and medullary continuity. In certain bones, such as the pelvis and scapula, CT scanning can be useful in planning surgery and localizing the lesion in the tissues. MRI is only needed in cases in which malignancy is a clinical concern or the relative anatomic structures in the soft tissues need to be localized. MRI is the modality of choice to assess the cartilage cap thickness. Thick cartilage caps (>4cm), especially when they are associated with pain, are suggestive of malignant degeneration⁷.

Grossly, the stalk is contiguous with the intramedullary marrow. The stalk is made up of mature bone. The cartilage

cap, which can be quite thick in children, is replaced by enchondral bone formation in maturing patients.

Microscopic examination reveals that the lesion is topped with a cartilage cap that can exhibit varying amounts of cellularity. The cap has an overlying fibrous layer that contains the mesenchymal cells that are thought to be responsible for the lesion's growth. The cells in the cartilage are orientated vertically, as is found in a growth plate. These lesions are benign lesions and can be staged under the Musculoskeletal Tumor Society (MSTS) staging for benign lesions.^{7,8}

No medical therapy currently exists for these lesions. The mainstay of treatment is observation because most lesions are asymptomatic. The treatment for symptomatic lesions is resection. Ideally, the line of resection should be through the base of the stalk; thus, the entire lesion is removed en bloc with its fibrous covering. Atypical or very large lesions should be fully investigated to exclude the remote possibility of underlying malignancy. MRI is useful in assessing the cartilage cap thickness.

Follow-up: The local recurrence rate after resection of osteochondroma is about 1.8%. Complications after surgical resection are rare. Considerations include epiphyseal disturbance or arrest, host bone fracture after resection, recurrence, incorrect diagnosis, and hematoma formation. For solitary osteochondromas, the outcome and prognosis after surgery are excellent, with excellent local control and a local recurrence rate of less than 2%. The process is a benign one; thus, the prognosis is usually one of complete recovery.

REFERENCES

- (1) Robbin MR, Murphey MD. Benign chondroid neoplasms of bone. *Semin Musculoskeletal manual* 2000; 4: 45-58.
- (2) K.K.Unni (ed). *Osteochondroma Dahlin's bone tumor*. Philadelphia Lippincot-Raven Publishers, 1996; 5: 71-108.
- (3) Ahmed AR, Tan TS, Unni KK, Collins MS, Wenger DE, Sim FH. Secondary chondrosarcoma in osteochondroma. *Clin Orthop Relat. Res.* 2003; 411: 193-206.
- (4) Hennekam RC. Hereditary multiple exostosis. *J Med Genet* 1991; 28: 262-266.
- (5) Mirra JM. Benign Cartilaginous exostoses. *Clinical radiologic and pathological correlations*. Lea and Febiger, Philadelphia 1989: 1626-1659.
- (6) Bovee JVMG, Cleton Jansen AM, Wuys W, Caethoven G, Tameniau AHM, Bakker E, Van Hul W, Carnelisse CJ. EXT mutation analysis and loss of heterozygosity in sporadic and hereditary osteochondromas. *Am J Hum Genet.* 1999; 65: 689-698.
- (7) Murphey MD, Choi JJ, Kransdorf MJ, Flemming DJ, Gannon FH. Imaging of osteochondroma variants and complications with radiologic pathologic correlation *Radiographics* 2000; 5: 1407-1434.
- (8) Jan M, Ali W, Churoo BA, Ahmad M, Hassan M. Hereditary multiple exostosis. *J K Practitioner* 1999; 6: 317.
- (9) Saritha S., Sundar NHS, Balpe RL Poornima GC, Rupa Kumar, Vani A, Exostosis of right scapula. *Journal of Anatomical Society of India* 2000; 50:2001-2006.
- (10) Ganguly S, Adhya D. Hereditary multiple exostosis. *Indian Pediatrics* 2000; 37:1021-1022.

ETHICAL GUIDELINES FOR BIOMEDICAL RESEARCH

The need for uniform ethical guidelines for research on human subjects is universally recognised. It has acquired a new sense of urgency as the critical issues in the area of biogenetic research involving human subjects have become acute. Apart from the mandatory *clinical trials* on new drugs, a number of *diagnostic procedures, therapeutic interventions and prevention measures* including the use of vaccines, are being introduced which involve human subjects. Further the advent of *new medical devices and radio-active materials* and therapeutic benefits of *recombinant DNA products* have added a new dimension to the ethical issues that need to be considered before evaluating these for their efficacy, utility and safety.

Any research using the human beings as subjects shall bear in

mind the following principles of : i) **essentiality**, (ii) **voluntariness**, **informed consent**, (iii) **non exploitation**, (iv) **privacy and confidentiality**, (v) **precaution and risk minimisation**, (vi) **professional competence**, (vii) **accountability & transparency**, (viii) **maximisation of public interest and distributive justice** (ix) **institutional arrangements** (x) **public domain** (xi) **totality of responsibility** and (xii) **compliance**.

Recent advances in the field of **Assisted Reproductive technologies, organ transplantation, Human genome analysis, and gene therapy** promise unquestionable benefits to mankind. At the same time, they raise many questions of law and ethics, stimulating public interest and concern.

(Source : ICMR Publication 2000)