

Reporting a Giant Diaphyseal Nutrient Foramen in a Dried Right Femur

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ABSTRACT

Nutrient foramen convey the vascular supply to the long bones. Anomalies in the morphology of nutrient foramen is crucial in understanding bone pathologies and operative procedures. Though extensive research has been done on the morphology and morphometry of normal nutrient foramina, literature was scanty on the abnormal nutrient foramen on femur. The present study reports a giant diaphyseal nutrient foramen encountered in a dried right femur. On routine observation of dried femora from the department of anatomy, one right sided femur exhibited an abnormal nutrient foramen in the shaft over the linea aspera. It measured 4.2 x 1.3 cms. The foramen was continued as a canal on the exterior of the bone near the upper end of linea aspera. The foramen proper had a radius of 1.4cms. Photographs were taken. All other foramina were found to be normal. The nutrient artery might be enlarged enormously while passing through this foramen converting it into a canal on the exterior itself. Understanding such anomalies is essential in dealing with conditions like micro vascular bone graft or internal fixation or fracture healing or non union or malunion as these are dependant on proper blood supply to the bone. The abnormal nutrient foramen may cause disturbances in the blood flow. The present study reports a rare anomaly of nutrient foramen over the linea aspera of a right sided femur.

KEYWORDS: Giant nutrient foramen, femur, linea aspera, diaphysis

INTRODUCTION

Long bones receive their vascular supply through nutrient arteries passing through an obliquely placed nutrient foramen persistently seen on the shaft. They provide blood supply to the whole medulla and inner 2/3rds of the cortex⁽¹⁾. During ossification in the early growth of the embryo, the vascular supply is essential which is determined by their location and number⁽²⁾. As stated by A.K.Datta⁽³⁾ the direction of nutrient foramen follows the dictum “to the elbow I go and away from the knee I flee” and this is due to differential growth of two ends of the long bone. Mammalian bones were studied by Henderson⁽⁴⁾ illustrating the position and number of nutrient foramen. Malukar etal⁽⁵⁾ evaluated miniature long bones for the nutrient foramina. The physiological importance of blood supply of long bones in fracture healing, union and abnormalities like malunion and nonunion were described by Robert⁽⁶⁾. Many studies have been done on the nutrient foramina of long bones. The morphology of nutrient foramen determines the efficiency of the blood supply to the bone. Femur, the strongest and longest bone of the human body needs a proper blood supply through a perfect nutrient foramen. Literature is scanty regarding the abnormal presentation of a nutrient foramen on femur. The present study has been done to report a very rare case of a dried femur with giant nutrient foramen on the superior part of linea aspera.

MATERIALS & METHODS

On routine examination of dried femora from the department of Anatomy, one femur was observed to show a giant nutrient foramen on the superior aspect of linea aspera

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RESULTS

Fig 1: posterior aspect of right femur with giant nutrient foramen



Fig 2: giant nutrient foramen on the diaphysis of right femur lateral view



Fig 3: giant nutrient foramen with bevelled edge and external canal



A giant nutrient foramen measuring 4.2 x 1.3 cms has been observed on the superior aspect of linea aspera of right femur. The margins of the foramen were bevelled and serrated and had a radius of 1.4 cms. The foramen was extended as a canal visible on the exterior of the bone.

DISCUSSION

Nutrient foramen on the femur is located on the linea aspera which lies on the posterior aspect of the shaft. Blood supply determines the effective healing of fractures as described by Johnson (7). The osteoblast and osteocyte survival facilitates graft healing in the recipient as stated by Craig et al (8). Priyanka et al (9) studied on clavicles and reported that

Knowledge about the variations of nutrient foramen help to select the prosthesis for internal fixation. The importance of nutrient foramen in osseous selection levels of the receptor in bone transplantation was put forth by Wavreille et al (10). Though the size appears small, the crucial role of the nutrient foramen has been described in various studies. Many authors have studied on the morphology and morphometry of nutrient foramina of long bones. But studies on abnormal nutrient foramen of femur were almost nil. The present study demonstrates a rare anomaly of nutrient foramen. Femur is the weight bearing bone of the body which requires a proper blood supply through a perfect nutrient foramen. Anomalies of the morphology of nutrient foramen could be the underlying cause of various pathologies. Knowledge about the variant anatomy of the nutrient foramen is helpful while performing operative procedures like bone graft or prosthesis or internal fixation. This study presents an extreme anomaly of a giant nutrient foramen in the right femur.

CONCLUSION

A giant nutrient foramen leading into an external canal has been reported on the superior aspect of linea aspera of a right sided dried femur. It is one of the rarest presentations.

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