A Study on the Number of the Nutrient Foramina in Adult Human Forearm Bones in Population of Uttar Pradesh

Rakesh Mishra1* - Sneha Yadav2

1Department of Human Anatomy, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Raibareli Rd, Utrathia, Chaudhary Vihar, Lucknow, Uttar Pradesh 226025, India
2Department of Pharmacology, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Raibareli Rd, Utrathia, Chaudhary Vihar, Lucknow, Uttar Pradesh 226025, India

*Corresponding author: Dr. Rakesh Mishra
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Abstract

The present study has been carried out to determine the number of the nutrient foramina in adult human forearm bones. The nutrient foramina are cavities that conduct the nutrient arteries and the peripheral nerves. The nutrient artery provides the main source of blood supply to the long bones. The present study was done on 114 adult human forearm bones comprising 57 radii and 57 ulnae to observe number of nutrient foramina and our result shows out of 114 forearm bones 105 bones (92.10%) had single nutrient foramina and 8 bones had double nutrient foramina and 1 bone had no nutrient foramina. We can conclude from the result both Forearm bones possess a nutrient foramina which enlightening to the resection in orthopedics and also for the bone grafting.

Keywords: Nutrient Foramina, Number, Radius, Ulna.

INTRODUCTION

The nutrient foramina are cavities that conduct the nutrient arteries and the peripheral nerves. The major blood supply for long bones originates from the nutrient arteries, mainly during the growing period and during the early phases of ossification [1-3]. Blood supply to the long bones in human body is by nutrient arteries, epiphysial arteries, metaphysial arteries and periosteal arteries [4]. Among these arteries, nutrient arteries play a major role by supplying inner 2/3rd of cortex and whole medulla of the diaphysis [5]. During childhood, long bones receive about 80% of the interosseous blood supply from the nutrient arteries, and in the case of their absence, the vascularization occurs through the periosteal vessels [6]. In bone grafts, the nutrient blood supply is crucial and it should be preserved in order to promote fracture healing [7, 3]. Moreover, the presence of preserved nutrient blood flow is essential for the survival of the osteocytes in cases of tumor resection, traumas, and congenital pseudoarthrosis [2, 3].

MATERIALS AND METHODS

The study was conducted on 114 adult human forearm bones comprising 57 radii (34 right + 23 left) and 57 ulnae (26 right + 31 left), each irrespective of sex and age obtained from the Department of Anatomy, Integral Institute of Medical Science and Research and King George Medical University, Lucknow. The inclusion Criteria are dry adult human Radius and dry human ulna bones irrespective of sex & age and exclusion criteria are deformed bones, damaged bones and bones with callous formation.

In all these bones after determining their side, nutrient foramina were observed with the presence of a well-marked groove leading to the foramen, and often slightly raised edge of the foramen at the commencement of the canal, in doubtful cases hand lens was used to determine number. The foramina at the ends of the bone were ignored.
**Observation and Results**

Table 1: Shows Number of Nutrient Foramina

<table>
<thead>
<tr>
<th>Bone</th>
<th>NUMBER OF NUTRIENT FORAMINA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absent</td>
</tr>
<tr>
<td><strong>Radius</strong></td>
<td></td>
</tr>
<tr>
<td>n=57</td>
<td></td>
</tr>
<tr>
<td>Right n=34</td>
<td>-</td>
</tr>
<tr>
<td>Left n=23</td>
<td>-</td>
</tr>
<tr>
<td>Total n=57</td>
<td>-</td>
</tr>
<tr>
<td><strong>Ulna</strong></td>
<td></td>
</tr>
<tr>
<td>n=57</td>
<td></td>
</tr>
<tr>
<td>Right n=26</td>
<td>-</td>
</tr>
<tr>
<td>Left n=31</td>
<td>01(3.22%)</td>
</tr>
<tr>
<td>Total n=57</td>
<td>01(1.75%)</td>
</tr>
<tr>
<td><strong>Total Forearm Bones n=114</strong></td>
<td>01(0.87%)</td>
</tr>
</tbody>
</table>

Fig-1: Ulnae (a) and Radii (b) used in the study as a material

Fig-2: Number of Nutrient Foramina in radii

Fig-3: Number of Nutrient Foramina in Ulnae
Table-1 and its Fig 2 & 3 shows that out of total 57 radii, single nutrient foramina was found in 55 radii (96.49%) and double nutrient foramina in 2 radii (3.50%). Out of 57 ulnae, single nutrient foramina was found in 50 ulnae (87.71%) and double nutrient foramina in 6 ulnae (10.52%). The nutrient foramina was not found in 01 Ulna (1.75%). Out of 114 forearm bones studied, 105 bones (92.10%) had single nutrient foramina, 08 bones (7.01%) had double nutrient foramina and one bone had no Nutrient Foramina.

**DISCUSSION**

Radii in Table-2, shows that in the present study, the highest percentage was that of single nutrient foramina (96.49%) while few double nutrient foramina (3.5%) were present, which is close to previous studies done by Parmar et al., [8] and Reddy et al., [9] Except, absence of nutrient foramina, was observed by Mysorekar [10], Murlimanju et al., [11] and Sharma M et al., [12] but not found in present observation.

Ulnae in Table-3, shows that absence of nutrient foramina in 1.75%, is close to observation of Mysorekar [10]. Also high percentage of single nutrient foramina (87.71%) while few double nutrient foramina (10.52%) were observed in the present study which is in similarity with Mysorekar [10], Sharma M et al., [12] and Patel et al., [13].

**CONCLUSIONS**

We can conclude from the result both Forearm bones possess a nutrient foramen which is key factor for the success of new techniques for bone transplant and resection in orthopedics.

**REFERENCES**


