RESEARCH
www.commprac.com
ISSN 1462 2815

COMPARISSON OF PARAMETERS IN POSTOPERATIVE RADIOLOGICAL EVALUATION BETWEEN DORSAL BRIDGE PLATE AND VARIABLE ANGLE PLATE IN INTRAARTICULAR DISTAL RADIUS FRACTURE

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DOI: 10.5281/zenodo.10276412

Abstract

Intraarticular distal radius fractures are one of the most common types of forearm bone fractures in adults. Surgery using dorsal bridge plates and variable angle plates is one of the techniques used to treat such fractures. However, there is no consensus regarding which technique is better in postoperative radiologic evaluation. Therefore, it is necessary to conduct a study to compare the effectiveness of the two techniques. The purpose of this study was to compare the parameters in postoperative radiologic evaluation between dorsal bridge plate and variable angle plate in intraarticular distal radius fractures. This study is a retrospective observational study by taking data from the medical records of patients who have undergone surgery for intraarticular distal radius fractures using dorsal bridge plates or variable angle plates. The data will be analyzed to compare postoperative radiological parameters, such as measurements of dorsopalmar angle, lateral angle, length and width of the bone affected by the fracture, and plate placement. The results showed that there was no significant difference in the acceptable alignment values in postoperative radiologic evaluation between the dorsal bridge plate and the variable angle plate. Therefore, the dorsal bridge plate can be an alternative implant option used in patients with distal radius fractures in hospitals with limited facilities, due to its high cost effectiveness and minimal risk of complications.

Keywords: Radiologic Evaluation, Postoperative, Dorsal Bridge Plate, Angle Plate, Intraarticular Distal Radius Fracture.

INTRODUCTION

Intraarticular distal radius fracture is a common condition in adults where there is a fracture or break in the lower radius bone close to the wrist joint (Meena et all, 2014). This condition usually occurs as a result of a fall with an open hand or an impact to the wrist. These fractures can cause pain, swelling, redness, and difficulty in performing hand and wrist movements (Orbay et all, 2022). Intraarticular distal radius fractures can be treated with various methods, including dorsal bridge plate and variable angle plate placement.

Dorsal bridge plate and variable angle plate placement are techniques used to stabilize the bone in order to heal intraarticular distal radius fractures (Khatri et all, 2016). The dorsal bridge plate is a plate placed on the dorsal side of the radius bone and joins the two halves of the broken bone (Fares et all, 2021). Whereas a variable angle plate is a plate that is placed on the front side of the radius bone and connects the two halves of the broken bone with an adjustable angle (Spiteri et all, 2017).

Although both techniques are used to treat intraarticular distal radius fractures, there is debate as to whether the use of a dorsal bridge plate or a variable angle plate provides better results in postoperative radiologic evaluation in patients with intraarticular distal radius fractures.

In addition, the treatment of distal intra-articular radius fractures is known to have a high cost. The cost of treatment depends on the type of technique used in the treatment, as well as the severity of the fracture. Typically, treatment for these fractures involves costs for medical consultations, radiology examinations, surgery if required, as well as post-operative care costs such as physical recovery and rehabilitation. Furthermore, costs can also be affected by the medical facilities used and the level of expertise of the medical personnel involved in the treatment. All of these factors can increase the cost of treating distal intra-articular radius fractures, so they need to be considered in medical treatment planning (Chirurchiga, 2023).

Therefore, it is necessary to conduct a study to compare the effectiveness of the two techniques in postoperative radiologic evaluation. This study can provide important information for doctors and medical personnel in determining the appropriate surgical technique to treat intraarticular distal radius fractures. In addition, this information can also help patients in choosing the type of surgery that suits their conditions and needs. Based on the background of these problems, the researcher is interested in conducting a study with the title "Comparisson Of Parameters In Postoperative Radiological Evaluation Between Dorsal Bridge Plate and Variable Angle Plate Intraarticular Distal Radius Fracture".

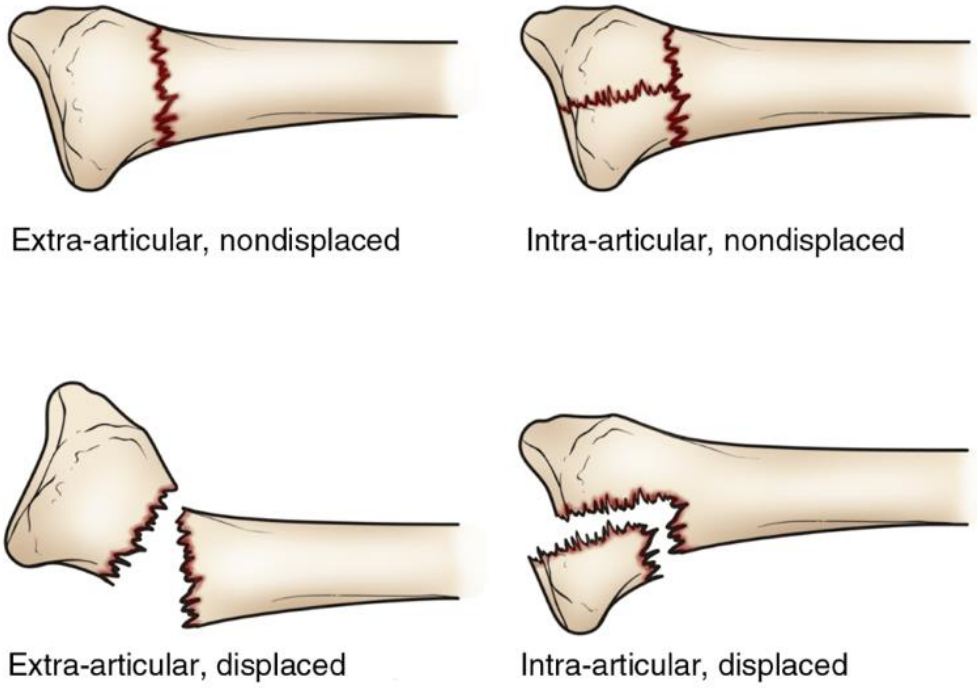
RESEARCH METHODS

This study was a retrospective observational study by taking data from the medical records of patients who had undergone surgery for intraarticular distal radius fractures using a dorsal bridge plate or variable angle plate. Observational studies, also known as analytical study designs, involve research conducted by researchers who observe and analyze the effects of an independent variable such as exposure on a dependent variable such as disease, or the relationship between the two variables in the absence of deliberate exposure, treatment, or intervention (Christy, 2014).

All patients who experienced intraarticular distal radius fractures and underwent fixation using a dorsal bridge plate or variable angle plate based on the surgeon's choice in Makassar during the period January 2019 to December 2022 will be the subject of the study. Patients were selected using a purposive sampling technique with inclusion criteria including patients with radius fractures AOC classification 23-B1-3 and AO 23-C1-3, aged over twenty-one years, and had an acute closed case less than one week after trauma. Patients who do not meet these criteria will be excluded from the study. Afterward, the patients will be divided into two groups, the dorsal bridge plate group and the variable angle plate group. Data will be analyzed to compare postoperative radiological parameters, such as measurements of the dorsopalmar angle, lateral angle, length and width of the bone affected by the fracture, and plate placement. However, this study also has some limitations. One of them is that this study was only conducted in a specific population with a limited number of samples. Therefore, further research is needed with a larger sample and population diversification to obtain more representative and accountable results.

DISCUSSION

An intraarticular distal radius fracture is a type of fracture in the bones of the forearm that occurs near the wrist joint. According to the American Academy of Orthopaedic Surgeons (AAOS), intraarticular distal radius fractures are fractures that occur in the wrist joint region and involve the joints of the radius and collarbone (ulna) where they meet at the wrist (OrthoInfo, nd). Intraarticular distal radius fractures can be a difficult condition to manage as accurate articular reconstruction may not be achievable using standard variable angle plate internal fixation. In some cases, the use of indirect reduction techniques with ligamentotaction may be a better option to preserve skeletal length and improve fracture alignment. There are various techniques that have been used to treat this type of fracture (Perlus et all, 2019).



Picture 1: Type of Distal Radius Fracture

Source: OrthoInfo

Dorsal bridge plating and variable angle plating are two techniques used to treat intra-articular distal radius fractures. The main difference between the two is in the way the plate is placed over the bone and the way it is fixed. Dorsal bridge plating is a technique where the plate is placed on the top of the bone, across the fracture area, and fastened to the intact bone next to it. This plate allows for even load distribution and good bone stabilization. This technique has been widely used and has proven effective in treating intra-articular distal radius fractures. Several studies have shown good results in terms of patient healing and function after using this technique (Chen & Zang, 2017). Variable angle plating, on the other hand, is a technique where the plate is fixed at a specific angle over the bone and fastened to the bone with variable angle screws. This technique allows for customization of the angle and position of the plate to correct fracture alignment more accurately. However, this technique also has some disadvantages, including the risk of poor screw placement or fracture, which can disrupt fracture alignment (Willis et all, 2016).

Research conducted by (Ring et all, 202) showed that there was no significant difference between acceptable alignment values on radiologic evaluation after surgery between dorsal bridge plate and variable angle plate. In addition, the potential clinical application of using dorsal bridge plates in patients with distal radius fractures in hospitals with limited facilities, due to its high cost-effectiveness, also has a minimal risk of complications. However, this study also highlights the importance of considering other factors such as cost of treatment and risk of complications in choosing the right surgical technique for the patient. These results are in line with previous studies that also showed no significant difference between the two techniques in terms of bone alignment.

Surgical radiography can influence postoperative function as it can provide information about the state of the patient's bones and joints after surgery. Surgical radiography examination can help the doctor to confirm that the surgical procedure has been successful and that the patient's bones or joints have been positioned correctly. If there is an error in the positioning of the patient's bones or joints, this can lead to impairment in the function of the patient's bones and joints. Surgical radiographs can also be used to monitor the patient's recovery progress during the post-operative recovery period. Thus, surgical radiographs are very important in the evaluation of postoperative patients and can assist doctors in determining the follow-up actions needed to ensure optimal recovery (Pribish et all, 2012).

The results showed that there was no significant difference between the acceptable alignment values on postoperative radiological evaluation between the dorsal bridge plate and the variable angle plate in intraarticular distal radius fractures. This means that both techniques are equally effective in restoring the patient's bone and joint function. This study was conducted by comparing radiological parameters, such as bone stabilization, joint alignment, and bone function recovery in patients who underwent surgery using both techniques. In this study, the results of radiologic evaluation were performed at a certain period of time after surgery, so that the effectiveness of each technique could be determined. However, it should be noted that the results of this study are only related to the postoperative radiology aspect, and further research needs to be done to evaluate other aspects, such as the cost and risk of complications in both techniques. In addition, the results of this study also need to be considered with individual patient conditions, such as fracture type, age, and general health condition.

CONCLUSIONS

Intraarticular distal radius fractures are one of the common types of fractures in adults in the forearm bone. One of the treatment techniques used is surgery using dorsal bridge plates and variable angle plates. However, there is no agreement regarding which technique is better in postoperative radiologic evaluation. Based on the results of the study, there was no significant difference in the acceptable alignment value in postoperative radiologic evaluation between the dorsal bridge plate and the variable angle plate. Therefore, the dorsal bridge plate can be an alternative implant choice used in patients with distal radius fractures in hospitals with limited facilities, due to its high cost effectiveness and minimal risk of complications.

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