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Research Article

Management of Radius and / Or Ulna Fracture by Screw Intramedullary Nail in Skeletally Mature Patients

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Abstract: The standard nailing of both bone forearm fractures of the radius and ulna poses a possible complication of nail migration and rotational instability, despite being one of the best reduction techniques. This study has strived to evaluate how effectively screw elastic intramedullary nail is useful in the therapy for mature diaphyseal fractures of both bone forearms. The issues faced with conventional nailing techniques for managing forearm fractures have also been discussed. A prospective evaluation of twenty-one cases with forearm fractures (radius and ulna or isolated fracture of the single bone) was done. Out of the twenty-one cases studied, eighteen patients had undergone closed reduction, and three cases required mini-open reduction. The fracture was categorized as claimed by Arbeitsgemeinschaft fur Osteosynthesefragen (AO) Foundation/Orthopedic Trauma Association(OTA). The results were evaluated according to Anderson criteria, in which 13 cases had excellent results, 4 had good results, 3 had an unsatisfactory result, and 1 was reported as failure. Also, there was 1 case of synostosis and 1 case of delayed union in radius. We concluded that the intramedullary screw nail for forearm fractures in adults could be used as a good internal fixation therapy giving excellent functional and radiological results. This technique is easy to learn, and the implant used is also cost-effective, thus, providing a good fixation of the fracture. The most accepted technique for forearm fracture, as per current recommendation and AO, are open reductions and internal fixation with plating, but our study is exclusive since it helped to overcome the failure of conventional nailing of both forearm bones with the potential complication of nail migration and rotational instability in spite the best reduction.

Keywords: Screw intramedullary nail, Radius fracture, Ulna fracture, Radius and ulna fracture, Both bone forearm.

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1. INTRODUCTION

Approximately 2 to 4 per 10,000 adults suffer from forearm fractures daily. In the past few years, due to rapid industrialization, an increase in the incidence of violence, road traffic accident, sports injuries, fall on an outstretched hand, and direct blow to the forearm, forearm bone fractures have been commonly encountered in Orthopaedic out-patient department. These forearm fractures, if at all treated ineffectively, lead to difficulty in activities of day-to-day life. Hence anatomical reduction becomes far more important, and maintaining the soft tissue integrity and vascularity are equally important to achieve the maximum functional outcome. For sufficient rotational function, the utmost requirement is to achieve anatomical reduction along with compression at the fracture site with rotational stability and normal length of the bone. The mal-aligned fractures influence the movement of theel bow and forearm. To prevent joint stiffness, early joint mobilization is crucial. And during open surgery, periosteal blood flow has to be managed by lesser damage to the soft tissue. For all fractures of the forearm bone, open reduction and internal fixation with a dynamic compression plate (DCP) is the suggested procedure[1]. Despite introducing other modern plate osteosynthesis techniques, including locking plates and limited contact dynamic compression plates (LCDCP), DCP remains a preferred choice among many surgeons[2]. Recent advancements in operational management and instrumentation have produced promising outcomes. This has led to an augmentation of surgical guidelines for these fractures and add-on debate about the technique and implant of choice. According to prior research, plate fixation improves bone radius and ulna fracture results. But it has some drawbacks, including longer recovery times, more blood loss, infections, non-union of the soft tissues, radioulnar synostosis, neurovascular injury, long scars, and soft tissue damage[3-8]. A different fixing technique for the left and right forearm fractures is intramedullary nailing, which has the advantages of shorter recovery times, bloodless field, soft tissue damage to a lesser extent, lesser periosteal stripping, and minimum disruption of the fracture analysis. In open diaphysis radial or ulnar fractures, an intramedullary nail might also be used [9,10]. The forearm fractures of the left and right sides can be managed with varied intramedullary implants such as square nails, flexible elastic nails, rush nails, and malleable wires. For quite a long time, closed reduction and internal fixation with these nails have been used [11,12]. Screw intramedullary nail is another innovative implant giving us the benefit of an intramedullary nail and provides reasonable fracture stability. The radial and ulnar bones are structurally balanced with interosseous membrane giving it stability in almost all the functions of the forearm. And slight destruction of this membrane leads to loss of rotation. Henceforth the reconditioning of the anatomy becomes the prime goal to regain function to the fullest. Maintaining the radial bow and ulnar length is also an important requirement for good function of the forearm[13].The advantage of the lock intramedullary nailing procedure is the capability of shortening metaphyseal, comminuted, and segmental diaphyseal forearm fractures[14,15]. The screw part of the nail at its end helps in the final insertion of the nail, which gets buried in the bone. The reduction can be achieved by the closed or mini-open method. The advantage of a low-cost implant, short duration of surgery, three-point fixation of the bone, and the union at the fracture site with the secondary callus is provided by a screw nail. It is scientifically easier to use and better suited for cases in rural areas that sometimes have financial problems and are ready to accept slab immobilization for a certain period. Here the main aim and objective of our study are to report a concept based on managing radial and ulnar fractures by screw-intramedullary nails in skeletally mature patients.

2. MATERIALS AND METHODS

Twenty-one adult patients surgically managed from December 2020 to November 2022 were retrospectively studied. Of these patients, 15 were men, and 6 were women. Five cases had the right side affected, and 16 had the left side affected. The patient's average age was 36, with anage range of 17 to 79.

Inclusion Criteria

- Above 18 years of age
- Closed and Grade I compound fractures.
- Diaphyseal fracture of radius and/or ulna.
- The patient has a pre-existing deformity in the ipsilateral upper limb joints.

Exclusion Criteria

- Pathological fractures of the forearm
- Grade II and III compound fractures
- Fracture in the metaphyseal regions of the radius and/or ulna
- Patient with neurological deficit in the ipsilateral limb affecting function.

2.1. Pre-operative procedure

All patients were subjected to detailed history to note the personal and demographic parameters and mechanism of injury. The physical examination was done to assess the level of fracture and associated injury and complications. The examination included an assessment to exclude compartment syndrome and ascertain neurovascular status. The x-ray of the forearm, including the elbow and wrist, was done to confirm the diagnosis and ascertain the fracture level, its type, and comminution. The fracture was classified as per AO/OTA classification. The patient's routine investigations were done for fitness regarding surgery. Consent was taken for surgery after explaining the risks of anesthesia and surgery and its advantages. The pre-operative length of the radius and ulna were measured. Ulna length was measured from the tip of the olecranon process to the ulnar head. The radius length was measured from the head of the radius to the lister tubercle. Proper nail diameter was assessed by seeing the canal size. Nails of measured size, less and more than of it, were kept ready in the operation theater. The patient was treated and followed up as per the protocol.

2.2. Material

The means of trauma in 11 cases (52.4%) was slip and fall injury, 6 cases (28.6%) had a road traffic accident, 3 (14.3%) had assault, and 1 case (4.7%) had other modes of injury (twisting injury while working), 16 cases (76.2%) did not have any associated injuries and 5 cases (23.8%) presented with other associated injuries [of them 1 case had presented with

a clavicle fracture, 1 case with tibia and femur fracture, 1 case with 2nd,3rd,4th right-sided metacarpal fracture, 1 case with posterior interosseous nerve (PIN) Neuropraxia, 1 case with Proximal interphalangeal joint (IP) dislocation in right-hand 5th finger]. Three cases (14.3%) had open fractures, and 18 (85.7%) had closed fractures. Among 21 cases studied, 3 cases (14.3%) had a radius bone fracture, 5 cases (23.8%) had an ulnar bone fracture, and 13 cases (61.9%) had both radius and ulna bones involved. Fractures were categorized using the classification proposed by AO/OTA (Table no. 1).

Table1: Distribution of Pattern of Fracture

Fractured bone	Pattern	AO/OTA Classification	No. of cases	% Cases
Radius	Transverse	2R2A3	9	56.2
	Spiral	2R2A1	3	18.8
	Oblique	2R2A2	3	18.8
	Wedge	2R2B3	1	6.2
	Segmental	2R2C2	0	0.0
Ulna	Transverse	2U2A3	8	44.4
	Spiral	2U2A1	3	16.7
	Oblique	2U2A2	4	22.2
	Wedge	2U2B3	2	11.1
	Segmental	2U2C2	1	5.6

The period from injury to the surgical procedure was 1-2 days (approximately 1-5 days). General anesthesia was used in three cases (14.3%), and 18 cases (85.7%), the brachial block was used. The tourniquet was used in 17 cases.

2.3. Detailing of the intramedullary screw nail

The screw intramedullary nail is a well-ordered circular nail with a screw structure at its proximal end and a beveled tip at the distal end. It is accessible in the diameter of 2, 2.5, 3, 3.5, and 4 mm with slanting tip lengths varying from 18 to 30 cm with 2 cm intervals. The weaved head is combined with the nail that is solid and circular and leads to the end of the nail having a carved or slanting tip for easy introduction into the bone. The proximal end screw portion has equal-sized threads embedded in the bone. The proximal-most part screw has hollowed part, which is engaged in the screwdriver of size 2.5mm through which the nail can be tightened and embedded in the metaphyseal part of the bone. The nails of diameter <3 mm, are relatively malleable. The nails 3 mm and above in diameter are not malleable. The screw size of the proximal end is 2cm in diameter, 5mm. The remote slanting end of the nail helps in fracture reduction and also assists in captivating the subchondral area of the bone, hence providing steadiness. Soft tissue irritation is prevented by adequately burying the nail's proximal end inside the metaphyseal area.

Fig 1: Screw intramedullary nail

2.4. Treatment

In the supine position, arm side on the table, the tourniquet was applied, affected upper limb was scrubbed with Savlon and betadine. 3 layered draping is done. The traction was applied by holding the thumb and fingers. Counter-traction was applied by flexion ofthe elbow to 90 degrees. Manipulation was done to achieve alignment of the bone and reduction of the fracture. Gadegone et al. 16 and Street et al. 17 have described a similar procedure in their article. The ulnar fracture was treated first because of its subcutaneous location and easy conformation of bone position. The longitudinal incision of approximately 1 cm was taken on the tip of the olecranon process. Soft tissue dissection was done, and entry was made in the olecranon tip using a small bone awl. Forearm reamers were passed in ascending diameter to assess the canal diameter and length of the bone. The appropriate size and diameter nail was instituted through the olecranon tip and inserted along the fractured site. The position was checked under C-Arm. Reduction of fracture was achieved by required manipulation, and the nail was pushed by the surgeon using a T- handle at the proximal end. The nail was put forth till the sub-chondral part of the ulnar head and the proximal-most screw part was buried in the bone, keeping one thread out. The entry site for the radial bone was the form of the Lister tubercle or the radial styloid

process. An incision of 2 cm was given over the decided entry site; while using an entry from the Lister tubercle, the 2nd (ECRL and ECRB) and 3rd (EPL), extensor compartments were dissected in between to reach the bone. Entry into the bone was made using a bone awl. The screw intramedullary beveled end was introduced and pushed gradually using the T-handle till it reached the fracture site. The reduction was achieved by manipulation, and the nail was pushed along till it reached the sub-chondral part of the head of the radius. The position was examined in both anteroposterior and lateral views. Whenever the reduction was not possible because of comminution and soft tissue interposition, a fine incision over the fracture site was taken, and reduction was achieved. In radius fixation, the nail was prebend for ease of insertion and better fixation due to 3-point bony fixation. The screw part of the nail was buried in the bone to avoid irritation of the overlying tendon and prevent any restriction of wrist movement. Closure in the incision of both radial and ulnar entry sides was done using ethilon 2-0. The tourniquet was released. The dressing was done, and an above-elbow slab was applied. The average time was surgery 58 minutes (range 30-90 minutes). In 3 cases, we performed mini-open surgery due to difficulty in reduction. Post-operatively as a follow-up, injectable ceftriaxone 1 gm IV BD was given for 3 days. The cases were discharged 14 days after surgery, and after 10-12 days of post-operative care, the stitch was removed. The above elbow slab was carried on for 6-8 weeks after stitch removal. For about 6 weeks, all the cases were given 500 milligrams of Elemental calcium and 500 milligrams of Ascorbic acid.

2.5. Outcome and follow up

Cases were reviewed at 3 weeks, 6 weeks, 12 weeks, and 24 weeks to assess the fracture radiologically and clinically. At the time of follow-up, functional features and range of movements of forearm supination and pronation and wrist flexion and extension were observed and documented. In addition, bony tenderness and suture site were examined. Q-DASH score and Mayo elbow performance score were used to assess the functional status of the forearm at each follow-up. In addition, the x-ray forearm AP and lateral views were taken to see radiological features like callus formation, maintenance of fracture reduction, widening or depression of articular surfaces, cubitusvarus, and valgus collapse. Nail back out, infection, irritation of tendons at the site of the screw, synostosis, neurovascular injury, and delayed union/ non-union were some of the complications of screw intramedullary nailing managed suitably. Final results were assessed using the Q-DASH scoring system, Mayo elbow performance score, and Anderson criteria. Q-DASH Score is based on the arm, shoulder, and hand functions. It is expanded as "Quick- Disability of Arm, shoulder, and hand. (Q-DASH)" Its value is more when the specific activities are not possible by the patient. These activities may be impossible during the ongoing union due to an element of pain and incomplete union at the fracture site. This scoring system includes assessing 11 upper limb activities involving elbow, forearm, and wrist functions. In the case of normal function, the maximum scoring is given. Scoring is reduced proportionately in case of difficulty carrying out a particular activity. Hence, the Q-DASH score will properly indicate functional ability/disability only when there is a complete clinical union and satisfactory radiological union. In forearm fractures, the period of union ranges from 12 weeks or more depending on the fracture anatomy, reduction, and stability of fixation. Anderson's criteria assessed the result at the last follow-up, including forearm and elbow movement and radiological union assessment. Good bridging callus in both AP and lateral view x-ray on follow-up radiographs was considered evidence of radiological union.

3. STATISTICAL ANALYSIS

All the data on categorical variables were depicted through the percentage of cases, and the data on continuous variables were visualized using mean and standard deviation. The inter-group statistical comparison of the distribution of categorical variables was tested using the Chi-square test and Fisher's exact probability test if more than 20 percent of thecells had an expected frequency of less than 5. In the whole of the study, the p values <0.05 were considered to be statistically significant. All the statistical analysis was done using the Statistical Package for Social Sciences (SPSS version 24.0, IBM Corporation, USA).

4. RESULTS AND DISCUSSION

4.1. Results

Total of 21 cases studied, 3 cases (14.3%) had age less than 20 years, 8 cases (38.1%) had an age between 21 – 30 years, 4 cases (19.0%) had age between 31 – 40 years, 2 cases (9.5%) had age between 41 – 50 years, 2 cases (9.5%) had age between 51 – 0 years and 2 cases (9.5%) had age above 60 years in the study group (Figure 2). Among 21 cases studied, 15 cases (71.4%) were male, and 6 cases (28.6%) were female in the study group (Figure 3). The time range of 10 to 26 weeks was the average follow-up. The average union time was 16 weeks. We had 1 case of synostosis, and 1 case had delay union. The functional outcome at the end of 24 weeks, according to Q-DASH [Table no. 2], was an average of 19.52. The result was graded according to Anderson's criteria [Table no. 3] at 24 weeks. In our series of 21 patients, 13 cases (61.9%) had excellent outcomes, 4 cases (19.0%) had satisfactory outcomes, 3 cases (14.3%) had unsatisfactory outcomes, and 1 case (4.8%) had a failure. According to Mayo, elbow performance scores> 90 points in 18 cases, 75-89 points in 2 cases, and 60-74 points in 1 case [Table no. 4]. Various figures from our study (Figure 4-7) have been shown with follow-up x-ray and functional movement at 24 weeks.

- ***Figures***

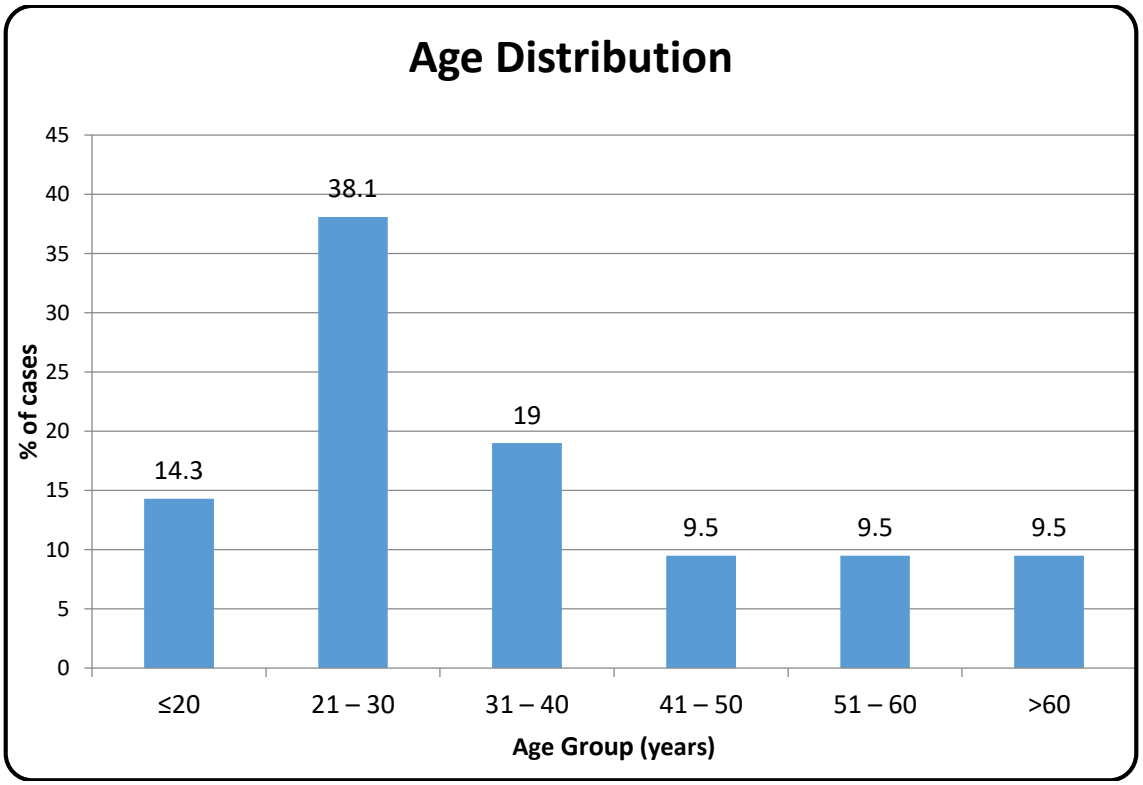

Fig 2: Age distribution

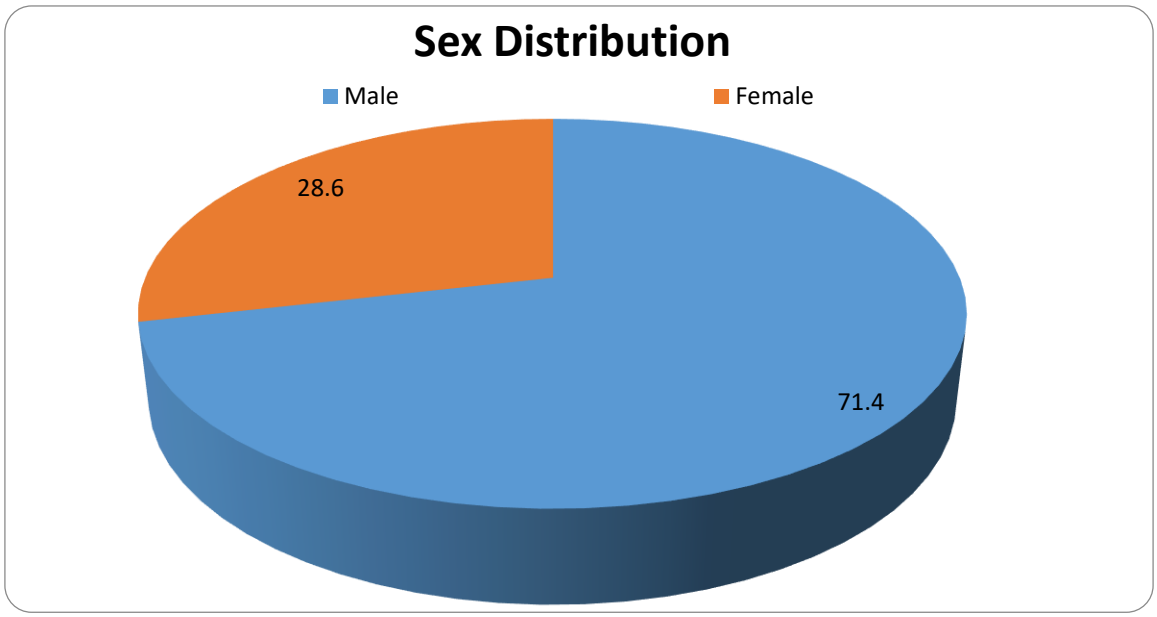

Fig 3: Sex Distribution

Table 2: Q-DASH Functional criteria

	No Difficulty	Mild Difficulty	Moderate Difficulty	Severe Difficulty	Unable
1. Open a tight or new jar.	+1	+2	+3	+4	+5
2. Do heavy household chores (e.g., wash walls, floors, etc.).	+1	+2	+3	+4	+5
3. Carry a shopping bag or briefcase.	+1	+2	+3	+4	+5
4. Wash your back.	+1	+2	+3	+4	+5
5. Use a knife to cut food.	+1	+2	+3	+4	+5
6. Recreational activities in which you take some force or impact through your arm, shoulder, or hand (e.g., golf, hammering,tennis, etc.).	+1	+2	+3	+4	+5

	Not At All	Slightly	Moderately	Quite A Bit	Extremely
7. During the past week, to what extent has your arm, shoulder, or hand problem interfered with your normal social activities with family, friends, neighbors, or groups?	+1	+2	+3	+4	+5

	Not Limited At All	Slightly Limited	Moderately Limited	Very Limited	Unable
8. During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder, or hand problem?	+1	+2	+3	+4	+5

	None	Mild	Moderate	Severe	Extreme
9. In the last week, please rate the severity of arm, shoulder, or hand pain.	+1	+2	+3	+4	+5
10. In the last week, please rate the severity of tingling (pins and needles) in your arm, shoulder, or hand.	+1	+2	+3	+4	+5

	No Difficulty	Mild Difficulty	Moderate Difficulty	Severe Difficulty	Cannot Sleep
11. During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder, or hand?	+1	+2	+3	+4	+5

Number of Completed Responses ('n'): _____ **Sum of 'n' Responses (55 points):** _____

$$\left(\left[\frac{\text{(sum of n responses)}}{n}\right] - 1\right) \times 25$$

Note: A Quick Dash score cannot be calculated if there is greater than 1 missing item.

Table 3: Anderson's Criteria

Result	Union	Flexion and extension at wrist joint	Supination and pronation
Excellent	Present	$<10^0$ loss	<25 % loss
Satisfactory	Present	$<20^0$ loss	<50 % loss
Unsatisfactory	Present	$<30^0$ loss	>50 % loss
Failure	Nonunion with or without loss of motion		

Table 4: Mayo elbow performance score[18]

Criteria	Points
Pain (45 points)	
None	45
Mild	30
Moderate	15
Severe	0
ROM (20 points)	
100 degrees	20
50-100 degrees	15
<50 degree	5
Stability (10 points)	
Stable	10
Moderate instability	5
Gross instability	0
Daily function (25 points)	
Combing hairs	5
Feeding oneself	5
Hygiene	5

Putting on shirt	5
Putting on shoes	5

Total score 100 points, > 90 points = excellent, 75 to 89 points= good, 60 to 74 points = fair and less than 60 points = poor Stable = no apparent varus-valgus laxity clinically, moderate instability = less than 10 degrees of varus-valgus laxity, gross instability = at least 10 degrees of varus-valgus laxity.

Table 5: Variable results	
Mayo Elbow performance	
> 90 points	18
75 – 89 points	2
60 – 74 points	1
< 60 points	0
Anderson criteria	
Excellent	13
Satisfactory	4
Unsatisfactory	3
Failure	1
Q- DASH scoring at 24 weeks	19.52

Follow-up photo (Case 1)

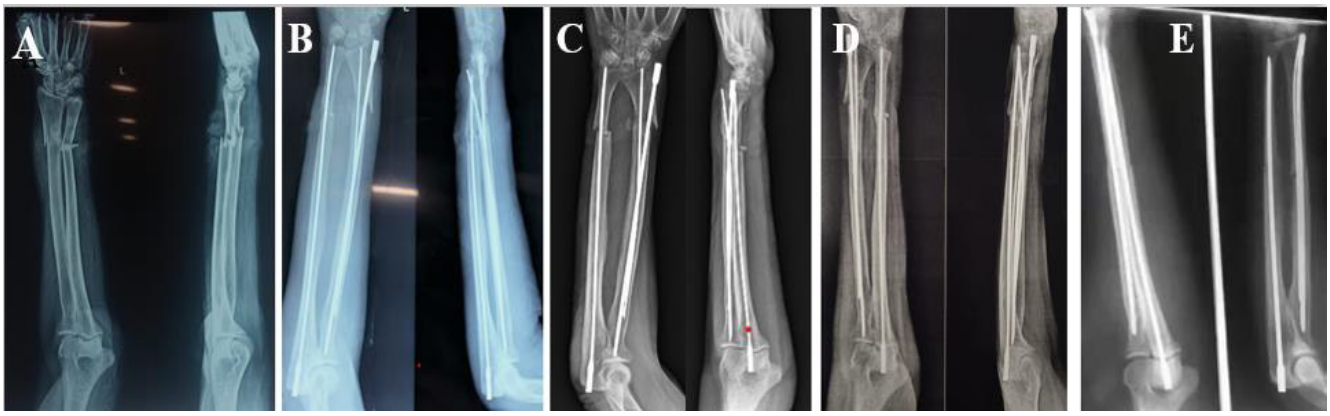

Fig 4: Showing follow-up x-ray at 3, 6, 12, and 24 weeks

Imaging during follow-up: - Imaging shows complete union and no fracture line. A: pre-operative x-ray shows distal 1/4th radius and ulna fracture on the left side; B: 3 weeks after the operation; C: 6 weeks after operation; D: 12 weeks after operations; E: 24 weeks after operations

Fig 5: Showing functional movement at 24 weeks

Functional movement pronation, supination, elbow extension, and flexion at 24 weeks

Follow-up photo (Case 2)

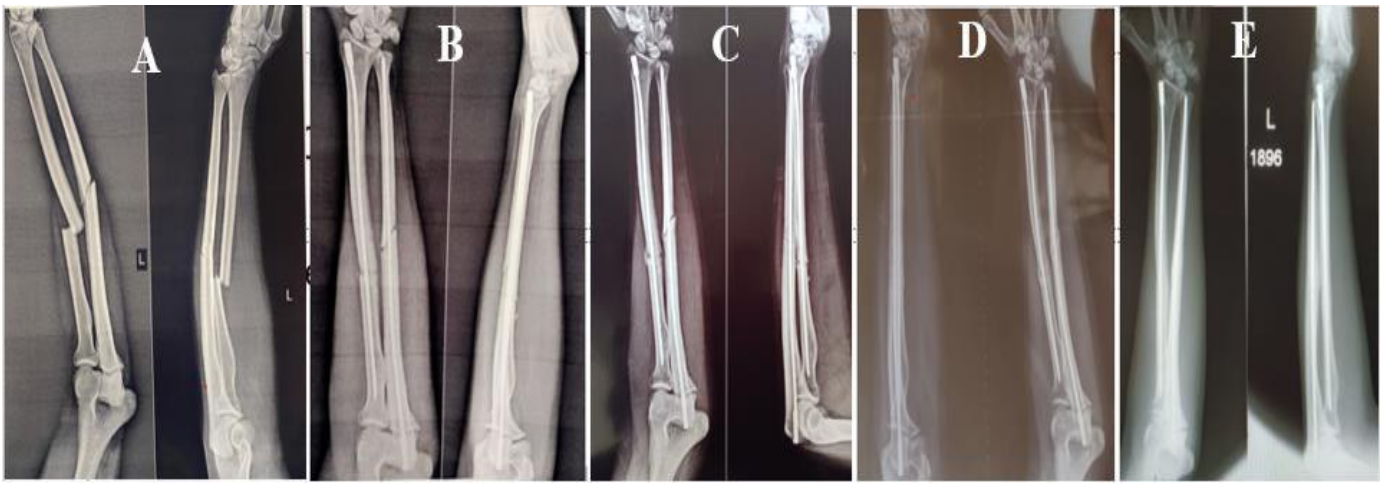

Fig 6: Showing follow-up x-ray at 3, 6, 12, and 24 weeks

Imaging during follow-up: - Imaging shows complete union and no fracture line. A: pre-operative x-ray shows midshaft radius and ulna fracture on the left side; B :3 weeks after the operation; C: 6 weeks after operation; D: 12 weeks after operations; E: 24 weeks after operations

Fig 7: Showing functional movement at 24 weeks

Functional movement pronation, supination, elbow extension, and flexion at 24 weeks.

3. DISCUSSION

Varied complications have been existed due to inadequate treatment and conservative management of forearm bone fractures. One of the widely used recuperation plans of action for fractures in the forearm is open reduction and internal fixation. The literature published in the past has depicted skillful and marvelous union rate results. The new nail design has increased the steadiness and healing of fractures and significantly altered the non-union rates. But the elastic intramedullary nail screw preserves the radial bow detailing the distal radio-ulnar joint problems and acts on the three-point fixation theory. Anderson et al.,[19] reported 96.3% union in the ulnar and 97.8% in radial fractures in 330 forearm fractures of 258 patients using open reduction and internal fixation with compression plates. Fracture union rates were reported as high as 87% to 98% in a few studies. Bone union in all patients was reported by Visna et al.[20] in 118 fresh fractures of 78 patients. Compared to the studies mentioned above, our research work, despite using intramedullary screw nails, got a percentage of fracture union of 92.1% which is approximately quite closer to the fracture union results depicted by the compression plate.20% non-union rates are common with traditional intramedullary nailing techniques like K-wire, rush nails, and Steinman pins. However, when square designs were used to enhance rotational stability, the non-union rates changed significantly[21,22]. Street et al. [17] observed that using square nails produced 93% union rates and 84% satisfactory functional results. In our study, using screw intramedullary, a delayed union rate was observed only in 1 case (4.8%). In the study by Gadegone et al. [16], the results of screw elastic intramedullary nails for treating adult diaphyseal fractures of both forearm bones were analyzed. They concluded that closed reduction and internal fixation of forearm fractures using screw intramedullary nails restored the anatomy of the damaged parts to near-normal. This study was quite similar to the current research work as an excellent result according to Anderson scoring system was shown in 13 cases (61.9%), which is quite near to the results shown by the study mentioned above with 50 cases (65.74%). Garampalli et al.[23] published a paper with contradictory findings compared to our study. They described the disadvantage of requiring post-operative immobilization until the bridging callus was discovered at the fracture site. They concluded that intramedullary closed nailing was not superior to plate fixation in adults. However, it can be used as an alternative to the diaphyseal forearm approach. Using an intramedullary nail, the average time required for the union was reported to be 14.8 weeks by Sandhu et al.[24], 14. In 3 weeks by Ghosh et

al. [25], 10.5 weeks by Kose et al.[26], and 10 weeks by Gao H et al.[14], our study reported an average time of 16.4 weeks. The results of our study are comparable with the case series as described in the literature, where the final functional results were drawn according to the Q-DASH scoring system with a score of 15 as reported by Nadeem A Lil. et al. [27], a score of 13.2 reported by Weekbach A et al.[28], score 13 by Ozakaya U et al. [29], Score 15 by Lee YH et al.[30], Score 14 by Bansal et al. [10], Score 11.2 by Yuksel Ugur Yaradilmis et al.[31]and a score of 19.52 reported by the present study. Compared to the standard plates, this implant is minimally invasive and decreases soft tissue dissection. Its screw end gets buried in the metaphyseal region, thus providing maximum strength and averting migration. Therefore, its usage as a biologically balanced technique with promising results has been encouraged nowadays.

4. CONCLUSION

The screw intramedullary nail for forearm fractures in adults can be used as a satisfactory internal fixation treatment method providing excellent functional and radiological outcomes. The technique is easy to learn, and the implant used is cost-effective with a short duration of surgery, three point-fixation along with the union at the fracture site due to the formation of secondary callus thus, providing good fixation of the fracture. In addition, this implant addresses the biological concept of biological healing and effectively controls rotatory forces and migration of nails.

5. ETHICAL APPROVAL STATEMENT

21 patients were included in this study who were confirmed to have radius and/or ulna fractures as reported in Acharya Vinoba Bhave Rural Hospital. This study was approved by the "Institutional Ethics Committee" (Ref no – DMIMS(DU)/IEC/2020-21/9376). All subjects had given written informed consent. The study inculcating human participants was by the "Central Ethics Committee on Human Research."

6. CONSENT FORM

The following consent was taken from the patient.

I, _____, the undersigned, hereby give my consent for participation in the case study entitled, "Management of Radius and/or Ulna Fracture by Screw intramedullary nail in skeletally mature patients" The study will be carried out by Dr. Parth Shah, Post Graduate Student of Dept. of Orthopedics and AVBRH. The case mentioned above study inculcates basic analysis. Therefore, I need more than the case study to be fruitful. But the data obtained from this study will prove fruitful to patients with forearm fractures in the coming future. Therefore, I consent to give all the required information to the researchers the required details like - Name, age, sex, address, chief complaints, personal history, history, and previous treatment history, which researchers assure would not be disclosed. The investigators will pay the entire cost of the study. I will not have to pay any charges related to the study.

7. ACKNOWLEDGEMENTS

I am grateful to Dr. Nareshkumar Dhaniwala, who helped me prepare the entire case study. I also thank my batchmate Dr. Poornima Pandey for helping find the case.

8. AUTHOR'S CONTRIBUTION STATEMENT

Dr. Poornima Pandey gathered the data and all the details of the patient. Dr. Nareshkumar Dhaniwala gave the necessary inputs required for preparing the case. All the authors have read and agreed to the whole of the manuscript.

9. CONFLICT OF INTEREST

Conflict of interest declared none.

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