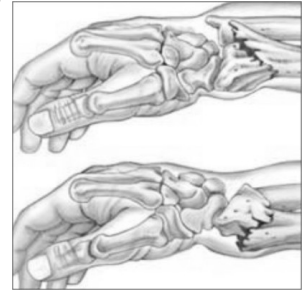


## ORIGINAL

(CLINICAL PRACTICE ARTICLE)

PROF-873

# COLLE'S FRACTURE; FIXATION BY PERCUTANEOUS K-WIRE



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**ABSTRACT...** [draktharbaig@yahoo.com](mailto:draktharbaig@yahoo.com) **Objective:** To evaluate results of treatment of Colle's fracture by percutaneous K-wiring POP. This method is popular in developed part of the world, however still not much used in our country. **Setting:** Department of Orthopedic- Unit I, Civil Hospital Karachi. **Period:** The study was started in 2003 and still on going. **Patients & Method:** 22 patients with displaced Colle's fracture were treated with per cutaneous K- wire. The fixation was augmented with below elbow back slab. Pins were removed after four weeks and replaced by below elbow cast for next two weeks. All patients were assessed radiographically and clinically at 3 months, 6 months and 12 months. **Results:** Our results show that there is over 95% good to excellent results with minimal complication in term of radiological and clinical assessment. **Conclusions:** Percutaneous K-wire fixation is a better alternative to simple POP cast and it does not require highly skilled person or sophisticated instrument for application.

**Keywords:** Colle's fracture, Per cutaneous pinning, K-wire.

## INTRODUCTION

Colle's fracture is a common fracture seen by orthopedic surgeons in their practice. It is named after Abraham Colle's who describe this fracture in 1814 in Edinburgh Medical and Surgical Journal<sup>1</sup>. The term Colle's fracture referred to fractures within 2.5 cm of lower end of radius usually produced by fall on out stretched hand.

Fracture must have at least 4 out of following criterias;

1. Impaction
2. Lateral displacement.
3. Lateral rotation

4. Dorsal displacement
5. Dorsal rotation.
6. Subluxation or disruption of inferior radioulnar joint<sup>2</sup>.

Injury is commonly affecting women over fifty years of age having postmenopausal osteoporosis<sup>3</sup>. However age and sex is not the limitation for the occurrence of this fracture. Fracture is usually treated by close manipulative reduction under Beir block or general anesthesia and application of POP cast. The aim of treatment is union of fracture in anatomical reduction. This is desirable but not always possible<sup>4</sup>. Reduction of fracture is not difficult,

nevertheless to maintain reduction in POP cast is almost impossible task, resulting in deformity and some functional loss. There is a definite association between anatomical and functional results<sup>5</sup>. If the fracture is allowed to unite in poor anatomical alignment a poor outcome is more likely<sup>6,7</sup>.

To overcome the problem of loss of reduction in POP cast especially in first 3 weeks, percutaneous K wiring of Colle's fractures is a better option. The successful percutaneous pinning was started by Clancey in 1984<sup>8</sup>. We found this method of treating the Colle's fracture is far superior than POP cast alone. We are sharing our experiences of percutaneous pinning of Colle's fracture to our orthopedic community.

## MATERIAL AND METHODS

The Study was conducted on adult patients at Civil Hospital Karachi in the Department of Orthopedic- Unit I. Few patients from our private clinic were also included in the study. The study was started in 2003 and still on going.

Total 22 patients were included in the study. Out of them 12 were males and 10 were female. The mean age was 41.95 years, with minimum age of 18 years and maximum age was 80 years. All female were house wives and all were involved in domestic accident of fall except one who fell from bicycle. Among male patients, eight were having history of fall while four sustained injury in Road traffic accident (RTA).

The study was based upon the clinical and functional outcome of closed reduction and percutaneous Kirschner wire fixation of displaced Colle's fracture.

The patients were followed for three to six months both clinically and radiologically. Complication and outcome were recorded. The data was recorded on a prescribed form, prepared carefully. All selected patients with displaced Colle's fracture were evaluated for history, examination and radiological assessment.

All displaced Colle's fractures manipulated either under G. A or Bier's block. After fracture had been reduced, it was fixed by two per-cutaneous K-wires. We are usually using cross K-wire to fix the fracture, however parallel pins were passed through radial styloid process across the fracture in few cases. Power drill or hand drill was used for the placement of pins while an assistant maintaining the reduction by holding the fracture in hyper flexion at wrist.

Exposed pin ends bended and sealed off with tincture benzene. Pin fixation was augmented by below elbow back slab. Reduction and the position of the pin checked by roentgenogram or by image intensification. Pins were removed after 4 weeks and below elbow cast were applied for further two weeks.

## RESULTS

In two patients with history of road traffic accident Colle's fracture was the part of poly trauma. In one patient intertrochanteric fracture of same side and ankle injury of opposite side was the accompanying injury. While other patient of poly trauma was having fractures of opposite radius and ulna along with radial head fracture.

Among ten female patients, two were near 60 years of age and three were over 60 years of age. These five patients were having osteoporosis noticeable on routine X-rays. One male patient of 60 years of age was hypertensive. Left hand injury was seen in 12 patients and in ten patients right hand was involved. All patients presented with painful swelling and deformity of involved wrist. In all patients fracture was displaced, angulated and impacted. Eight patients were having dorsal comminution while none was having intra articular involvement.

In all patients, fracture was fixed on same day except one with intertrochanteric fracture that was operated on next day of injury. Among 11 patients G.A was used, 11 patients made pain free by Bier's Block during surgery.

Maximum time of follow up was 1 year, minimum time of follow up was 3 months with average of 7.5 months.

Assessment of results was made according to Cooney et al.<sup>9</sup> criteria based on clinical and functional grounds in terms of pain, functional status, range of movement and

grip strength of hand. Radiological and clinical union of fracture is also considered in the assessment of results.

Table-I

Age	Sex	Side	Pain score	Range of movement	Muscle power	Functional out come	union/non union	Result score	Complication	Result
22	Male	Rt	15	15	15	20	Union	85	Pin tract infection	Good
38	Male	Lt	15	15	20	20	Union	90	-	Good
28	Male	Lt	15	15	15	20	Union	85	-	Good
32	Male	Rt	15	20	20	20	Union	95	-	Excellent
65	Female	Lt	15	15	15	20	Union	85	-	Good
55	Male	Lt	15	20	15	20	Union	90	-	Good
58	Female	Lt	15	15	15	15	Union	80	-	Satisfactory
40	Male	Lt	15	15	15	20	Union	85	-	Good
20	Female	Rt	5	15	20	20	Union	90	-	Good
60	Male	Rt	15	15	15	20	Union	85	-	Good
35	Male	Lt	20	20	20	20	Union	100	-	Excellent
35	Female	Lt	20	20	15	20	Union	95	-	Excellent
60	Female	Lt	20	15	20	20	Union	95	-	Excellent
25	Male	Rt	20	20	15	20	Union	95	-	Excellent
18	Male	Lt	15	15	15	20	Union	85	-	Good
48	Female	Rt	20	15	15	20	Union	90	-	Good
45	Male	Rt	20	15	20	20	Union	95	-	Excellent
22	Female	Lt	20	20	20	20	Union	100	-	Excellent
42	Male	Lt	20	15	20	20	Union	90	-	Good
80	Female	Rt	15	15	15	20	Union	85	-	Good
30	Female	Rt	15	15	15	20	Union	85	-	Good
65	Female	Rt	20	15	15	20	Union	90	-	Good

Good to excellent results were seen over 95% of cases. The only slight compromised result was seen in one case that was lost to follow up in initial two months. However came back thereafter, but with pin tract infection by

staphylococcus aureus.

He was treated by oral antibiotic, removal of pin and multiple dressing after debridement. No patient had reflex

sympathetic dystrophy, tendon rupture nerve compression syndrome or pin failure.

Whereas score for each criteria is as follows;

Pain	Score Point
No pain	20
Mild pain (tolerable)	15
Moderate pain (needs analgesic off & on)	10
Moderate pain but needs regular analgesic	5
Need fusion for wrist	0

Range of movements as compared with normal side in all plans.	
100% normal range of movement	20
Restricted less than 50%	15
Restricted more than 50%	10
Restricted less than 25%	5
Restricted more than 25%	0

Muscle power as compared to opposite side.	
Equal to normal side	20
Reduced 25%	15
Reduced 50%	5
Reduced 75%	0

Functional out come	
Resume his previous job	20
Able to perform previous activity with NSAID off and on	15
Able to perform previous activity with analgesic	10
Change of profession	5
Unable to do any work with same hand	0

State of fracture union	
Union	+20
Non union	-20

RESULTS	
Excellent	91-100
Good	81-90
Satisfactory	71-80
Fair	61-70
Poor	51-60

## DISCUSSION

In our part of world Colle's fracture is usually treated by close manipulative reduction and application of POP cast. The reduction may be lost during application of plaster as it is not properly held by assistant or it may be lost when edema subsides and the cast become loose, resulting in deformity and some functional loss. It is well known fact that in Colle's fracture anatomical results affect the final function. Mal-united Colle's fracture result in weak, deformed, stiff and painful wrist<sup>5,6,7,10</sup>.

External fixator is another option widely used for Colle's fracture all over the world<sup>11,12</sup>. However it is indicated in comminuted or open fractures and also requires skilled person and sophisticated instrumentation for application. In addition external fixator is highly expensive. K-wire on the other hand is economical and simple to apply. It does not require a highly skilled person and complicated tool for application. Our success rate is over 95% due to facts that, all surgeries performed within six hours after arrival in casualty department except one that was operated with in 24 hours after injury. In addition all were operated by senior surgeons under G.A or Bier's block. These results are comparable to other studies.<sup>5,8,13</sup>

The pin tract infection is seen in one case that did not come in follow up in initial two months. However came back thereafter, with pin tract infection by staphylococcus aureus. That was treated by oral antibiotic, removal of

pin and multiple dressing after debridement. No other complication encountered in our series. These results are also comparable with other series on percutaneous pinning of Colle's fractures<sup>5,8,13</sup>.

## CONCLUSION

We feel that percutaneous pinning of Colle's fractures is a far better alternative to simple POP cast. However it has comparable results with external fixation of Colle's fracture. It does not require highly skilled person or sophisticated tool for application.

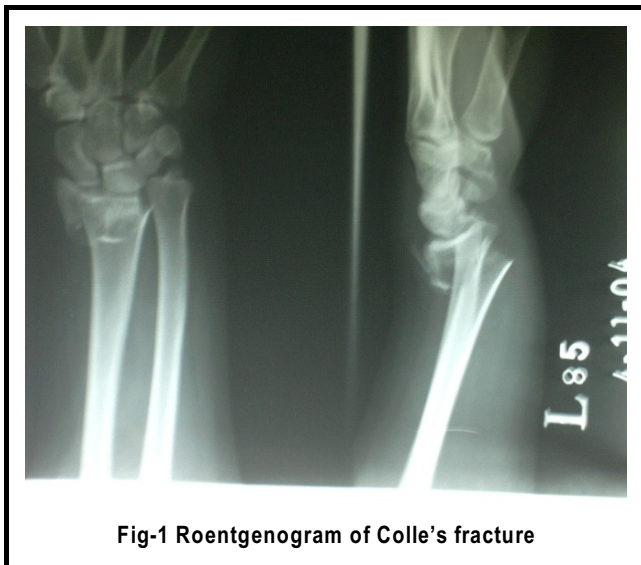


Fig-1 Roentgenogram of Colle's fracture

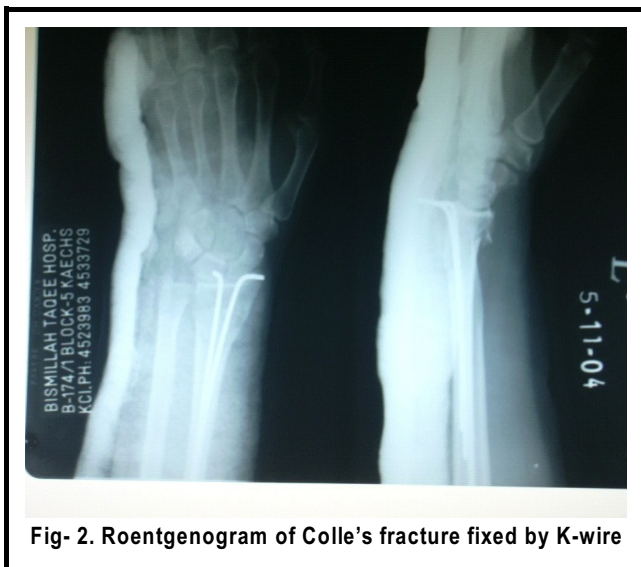


Fig- 2. Roentgenogram of Colle's fracture fixed by K-wire



Fig-3. 1 year after removal of K- wire.

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**Success is as ice cold  
and lonely as North pole.**

**Vicki Baum**