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A Study of Talar Neck in Detail by Comparing the X-Ray Foot Oblique View with Canale and Kelly View

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ABSTRACT

Background: Medical imaging plays a vital role in providing images of the soft tissue and internal structures of the body. It uses different modalities for diagnosis and treatment in healthcare for all age groups. For initial diagnostic accuracy, x-rays are instrumental in identifying and assessing fractures, helping clinicians determine the type and severity of the injury. Imaging of the talar neck was quite difficult to interpret in routine foot projections.

Method: It is a cross-sectional study with a sample of 50 patients was included. The inclusion criteria were patients with long-term foot pain, walking difficulty, ATFL, osteoarthritis, road traffic accidents, ortho implants and exclusion criteria were patients with no complaints of foot injury, pregnant women.

Result: In this study we evaluated 50 patients, the addition of Canale and Kelly's view radiographs can improve the efficacy of talar neck identification as well as alter clinical treatment plans. Our data demonstrates a trend toward increased accuracy of talar neck identification with the addition of Canale and Kelly's view radiographs.

Conclusion: It is evident that the Canale and Kelly's view is necessary to obtain a correct view of the talar neck and to correctly identify fractures. It provides a clear visualization of the talar neck and will reveal any neck displacement or malreduction..

Keywords: *Canale and Kelly view, osteoporosis, superimposition, talar neck, tarsal bones*

1. BACKGROUND

Medical imaging plays a vital role in providing images of the soft tissue and internal structures of the body. It uses different modalities for diagnosis and treatment in healthcare for all age groups. For initial diagnostic accuracy, x-rays are instrumental in identifying and assessing fractures, helping clinicians determine the type and severity of the injury. Imaging of the talar neck was quite difficult to interpret in routine foot projections.

In this study, a special view known as Canale and Kelly view is used to image the talar neck for a better assessment. This makes the physician to interpret a much more convenient diagnosis. By this special view, we produce better quality radiographs of talar neck without the superimposition of other tarsal bone. so, helps in avoiding the magnetic resonance imaging further to assess the superimposition.

Methods

It is a cross-sectional study performed at the Department of Radio-Diagnosis, ACS Medical College and Hospital, DR. MGR Educational and Research institute, Chennai, from a period of November 2023 to May 2024 after getting clearance from institutional ethical committee. Informed consent was obtained from all patients prior to examinations. There were 50 patients included in this study.

Inclusion criteria include patients with long-term foot pain, walking difficulty, anterior talo-fibular ligament injuries, fractures, osteoarthritis, road traffic accidents, ortho implants[10].

Exclusion criteria are patients with no complaints of foot injury, pregnant women.

All the patients underwent x-ray on 100 mA x-ray machine (ALLENGERS 625) with a field of view from distal phalanges to calcaneum. The kilovoltage Peak ranges from 40 – 55 and milli-Ampere second ranges from 20 – 30.

2. RESULT

In this study we evaluated 50 patients whether the addition of Canale and Kelly's view radiographs can improve the efficacy of talar neck identification as well as alter clinical treatment plans.

This data describes the demographics and outcomes of a study involving 50 patients.

Gender distribution: Male is 54.0% of patients and Female is 46.0% of patients as shown in *Table I*- [patient population is slightly male-dominated, with 54% male and 46% female. This indicates a relatively balanced gender distribution]

Age distribution: Patients are classified according to their age between 16-25 (12.0%), 26-35 (18.0%), 36-45 (20.0%), 46-55 (28.0%), 56-65 (12.0%) and 66-75 (10.0%) as shown in *Table II*

The age range of the patients spans from 16 to 75 years, categorized into six age groups.

The largest age group is 46-55 years, representing 28% of the patients.

The age groups 36-45 and 26-35 also represent a significant portion of the patient pool, at 20% and 18% respectively.

The youngest age group 16-25, and the two oldest age groups 56-65 and 66-75, each represent smaller portions of the patient population. This indicates a distribution skewed towards middle aged patients.

Outcome Distribution: Among the 50 patients, in Canale and Kelly's view the outcome are as follows: Osteoporosis are 24.0%, Osteophytes are 16.0%, Osteoarthritis are 14.0% and Fracture are 10.0% as shown in *Table III.*

The study examined four specific outcomes: Osteoporosis, Osteophytes, Osteoarthritis, and Fractures.

Osteoporosis was the most prevalent outcome, affecting 24% of the patients. Osteophytes and Osteoarthritis were also significant, affecting 16% and 14% of the patients, respectively. Fractures accounted for 10% of the recorded outcomes.

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Table 1: Summarizing the gender distribution in the study population which is expressed in the percentage

GENDER	COUNT	PERCENTAGE
MALE	27	54.0%
FEMALE	23	46.0%
TOTAL	**50**	**100%**

Table 2: Summarizing the age distribution in the study population which is expressed in the percentage

AGE	COUNT	PERCENTAGE
16-25	6	12.0%
26-35	9	18.0%
36-45	10	20.0%
46-55	14	28.0%
56-65	6	12.0%
66-75	5	10.0%
TOTAL	**50**	**100%**

Table 3: Summarizing the pathology distribution over gender population which is expressed in the percentage

PATHOLOGY	NO.OF. CASES	PERCENTAGE
NORMAL PATIENTS (No abnormality)	18	36.0%
OSTEOPOROSIS	12	24.0%

OSTEOPHYTE	08	16.0%
OSTEOARTHRITIS	07	14.0%
FRACTURE	05	10.0%
TOTAL	**50**	**100%**

LIST OF FIGURES

Figure 1: Demonstrating the position of Canale and Kelly view

Figure 2: Demonstrating the x-ray image of Canale and Kelly view

Figure 3: A 49 years old female came to the department of radio-diagnosis for radiographic examination of her left foot for the purpose of long-term foot pain. The patient was advised to take Canale and Kelly view which gave the finding of minimal marginal osteophytes.

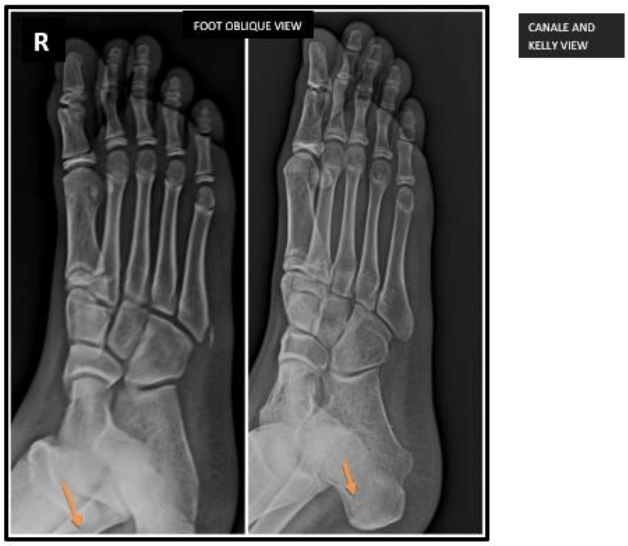

Figure 4: A 52 years old male came to the department of radio-diagnosis for radiographic examination of her right foot for the complaint of road traffic accident The patient was advised to take Canale and Kelly view which gave the finding of transient osteoporosis.

3. DISCUSSION

This study was conducted in the Department of Radio-diagnosis, ACS Medical College and Hospital, DR.MGR Educational and Research institute Chennai., after getting informed consent, which enlisted the participation of 50 patients undergoing imaging with 100 mA x-ray machine (ALLENGERS 625). Canale and Kelly view is a special view that provides the clear visualization of talar neck without the superimposition of other tarsal bones[13]. Among the sample size of 50 patients, the talar neck was clearly visualized without any superimposition for 81.0% of the patients. This demonstrates the effectiveness of the Canale and Kelly view in achieving its intended purpose. And clear visualization of the talar neck is crucial for diagnosis

and other pathologies

4. CONCLUSION

It is evident that the Canale and Kelly's view is necessary to obtain a correct view of the talar neck and to correctly identify fractures[14]. It will reveal any neck displacement or malreduction. It is also effective view to better demonstrate the talar neck angulation, dislocation, shortening and comminution[15]. So, that Canale and Kelly view should be included as an alternative for foot oblique view, for the complete visualization of talar neck without the superimposition of tarsal bones.

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