Journal of Clinical Orthopaedics and Trauma xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Journal of Clinical Orthopaedics and Trauma

journal homepage: www.elsevier.com/locate/jcot

Original article

Oblique "Scotty dog" versus antero-posterior (AP) views in performing x-ray guided facet joint injections☆

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ARTICLE INFO

Article history:
Received 18 September 2016
Received in revised form 12 September 2017
Accepted 21 October 2017
Available online xxx

Keywords:
Oblique "Scotty dog"
Antero-posterior (AP)
Facet joint
Back pain
Facet injection

ABSTRACT

Background: Facet joint pain contributes significantly to lower back pain. Image intensifier x-ray guidance is used to locate the facet joints. This can either be in the oblique "Scotty dog" or antero-posterior views. The aim is to investigate whether improved visualisation of facet joints using the oblique method would increase the accuracy of the injection and hence lead to enhanced pain relief effect when compared to AP views in Lumbar facet joints.
Methods: Single centre, single blinded. A total of 42 consecutive patients were recruited between December 2014 and March 2015 at Colchester General Hospital. Patients randomly allocated into facet joint injections using the oblique or AP projection. Pre-operatively the patients were asked to rate their back pain using a numerical 11 point pain rating scale in the questionnaire. Post-operatively patients were seen at 6 weeks and once again were asked to fill out the afore mentioned questionnaire. The results were collated and statistical analysis performed using Microsoft Excel.
Results: 29 patients returned their post-op questionnaire at approximately 6 weeks post-op. 12 patients had oblique view and 17 patients had AP view. There was a statistically significant difference in the pain scores comparing pre and post op scores for both the Oblique and AP groups. However, there was no significant difference when comparing the post-op pain scores or the absolute changes in pain scores between the two groups.
Discussion: Spinal facet joint injections provide significant relief at the 6 week post-op follow up with no difference between the oblique and AP techniques.

1. Introduction

Mechanical lower back pain has long been an area within medicine that represents a treatment challenge. It often has complex, multi-factorial pathology. The role of the facet joint in back pain is well recognised and has been discussed extensively within the literature. In some instances, it can be a significant cause in 15–40% of cases.[1–6] The pain from facet joints can be either a direct result of the arthritic process or due to secondary impingement on surrounding structures. Lumbar facet joints are innervated by medial branches of the primary dorsal rami. Each primary dorsal ramus provides supply to the facet joint at the corresponding level and the level below.[7] Facet joint injections therefore can offer a simple, safe and potentially effective solution in the symptomatic management of this condition.

There are two approaches described for injections to treat facet joint pain. The first and more commonly used one is the medial branch block. The other is direct facet joint block.[8] For medial branch blocks, the target point will be the junction of the superior facet and the transverse process. On oblique view this lies high on the eye of the Scotty dog. With regards to visualisation of the facet joint itself, the target point will be the midpoint of the silhouette of the joint cavity. If this is not visualised, it could be either due to the destructive arthritic process or malposition of the x-ray beam.[9] In order to obtain the oblique "Scotty dog" view, the c-arm is angulated by 25–35° towards the required side. The eye of the Scotty dog represents the pedicle.[8]

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https://doi.org/10.1016/j.jcot.2017.10.010
0976-5662/© 2017

Increasing the accuracy, hence potentially the efficacy of facet joint injections has previously been described in the context of using ultrasound and CT guidance. However, within the financial and logistical constrains of many units these modalities are often not available or are associated with increased costs. The use of intra-operative x-ray Image intensifier is simple, readily available, and common practice within the Orthopaedic departments.

In this single centre study we therefore examine two techniques available for visualising the facet joint using the image intensifier and compare the efficacy of each. Our null hypothesis is that oblique "Scotty dog" x-ray views do not increase accuracy of delivery into the facet joint, hence would not increase efficacy of the injection compared to AP x-ray views.

2. Methods

A prospective single centre study was undertaken. 42 consecutive patients were enrolled into the study between December 2014 and March 2015 at our hospital, Orthopaedics department, Spinal Surgery. There are two consultant spinal surgeons, one utilises the oblique "Scotty dog" view technique whilst the other uses AP view technique to visualise facet joints and perform facet joint injections. The patients were randomly allocated through way of referral to either one of the spinal surgeons by the spinal multi-disciplinary team. The study is single blinded as the patients did not know which Surgeon used which technique. All of these patients described symptoms of mechanical lower back pain, with a sub-set of these patients also described leg pain due to nerve root compression. No exclusion criteria were applied to the patient selection. The decision to list the patient for injection is taken by the consultant in clinic based on the clinical and radiological findings. All the patients were listed for a therapeutic pain relieving treatment rather than for diagnostic purposes.

A pain questionnaire was designed by the lead author. This was based on using the validated 11 point numeric rated scale from 0 to 10 with a score of 0 representing no pain and 10 the worst pain ever. This was also supplemented with a Visual analogue scale and 4 point categorical verbal rating scale to help the patients provide as accurate a numeric pain score as possible (See Fig. 1). Pre-operatively the patients were asked to rate their back pain using the questionnaire on the morning of the surgery. They were asked to rate it based on an average over the preceding 6 weeks. This was to ensure that an adequate representation of their pain was recorded. There were three surgeons involved, one consultant grade and two specialist registrars in performing the injections. A standardised protocol for obtaining the views and performing the injections were agreed.

The facet joints were visualised using image intensifier with either an oblique "Scotty dog" view or standard antero-posterior

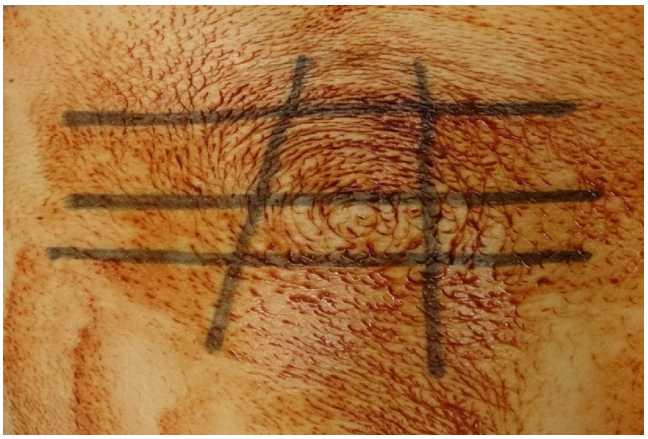

Fig. 2. Marking of the facet joints on AP x-ray view.

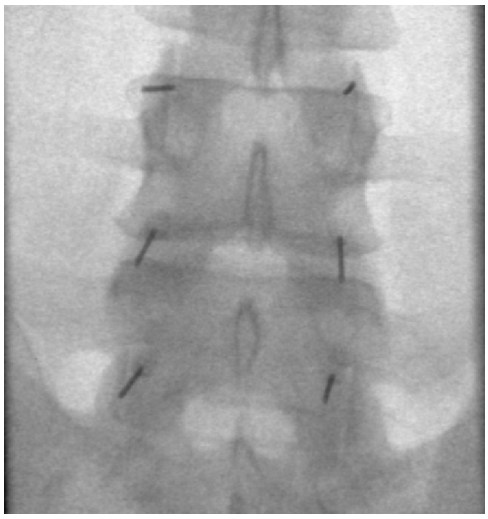

Fig. 3. AP x-ray visualisation of the facet joints.

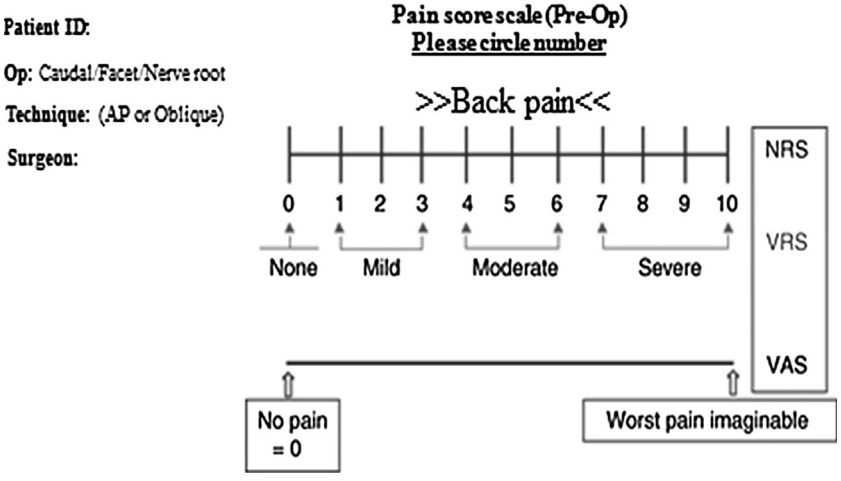

Fig. 1. Pre-operative pain score questionnaire.

Please cite this article in press as: K. Al-Tawil, et al., Oblique "Scotty dog" versus antero-posterior (AP) views in performing x-ray guided facet joint injections, J Clin Orthop Trauma (2017), https://doi.org/10.1016/j.jcot.2017.10.010