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BLIND DIRECT TROCAR INSERTION

General Surgery

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ABSTRACT

Since the inception of laparoscopic Surgery till today, there is no consensus on the safest first entry technique for pneumoperitonium. Several techniques have been adopted(most common being the Verres and Open Technique), but none are having full proof safety. Direct blind trocar entry without pnemoperitonium is least tried technique due to the apprehension of carrying greater risk of visceral or vascular injury.

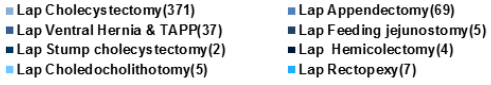
The Blind Direct Trocar Insertion (BDTI) prior to pneumoperitonium in laparoscopic surgery was first described by Dingfelder more than 40 years ago, but so far the procedure has been mainly used by the gygynaecologist[1]

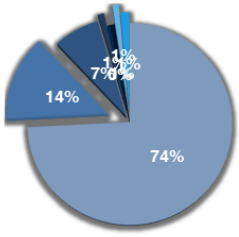
In this randomised prospective study of BDTI before pneumoperitonium on 500 cases over nearly two and a half years time, it was an effort to establish its safety similar to other entry techniques. It is as safe as any other methods of entry techniques. Only one blind procedure is involved and there is no chance of parietal insufflation. Moreover, quick pneumoperitonium reduces the total operative time.

KEYWORDS

METHODS

Five hundred patients have undergone pneumoperitonium by BDTI between March 2015 to August 2017. Selection of patients were done by excluding patients with known abdominal lumps, BMI => 35, acute abdomen, pregnant women post first trimester and patients having history of surgeries with midline incision or multiple scars. All operations were performed by the same Surgeon. No separate consent has been taken for BDTI, as first entry is an integral part of any intra abdominal Laparoscopic procedure for which informed consent is always taken, moreover BDTI is a known though less tried option. Out of 500 patients 193 were Male and 307 were Female. Age of the patients were between 16yrs and 78yrs. The pathologies of the patients selected for BDTI are as per the table below.



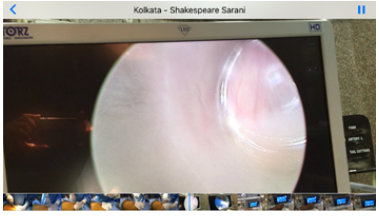


Site of insertion of the trocar was either through the umbilicus or through the Palmers point. At the umbilicus the skin and the fascia are adherent and chances of injury to vessels are minimum and Palmer's point is the second most safe area after umbilicus, as this area has least chances of getting affected by any adhesions. Palmer's point is also safe for the obese patients.

After an 10mm incision, a sharp 10mm trocar was used to minimise the push force during its insertion. An angle of 60 degree with the abdominal wall for patients having BMI <30 and perpendicular in patients with BMI >30 to avoid vascular injury. Intra abdominal pressure(IAP) was set at 12mm of Hg in all cases with flow rate at 12L per minute. The stop cock of the trocar was always kept open. This abolishes the negative intra abdominal pressure thus, helping the intra abdominal organs to fall back from the parietal apposition. This reduces the chances of injury during the trocar insertion (2). Elevation of the abdominal wall helps to guide the trocar towards the pelvis(3).

The elevation of the abdominal wall during the insertion also helps to counter the push force effect(4). it also increases the distance of the abdominal viscera from the tip of the trocar thus reducing the chances of any injury(3). Though recently it has been found that there is no difference in chances of injury with elevation or no elevation(8). Following insertion of the Trocar, the cannula was withdrawn and the laparoscope

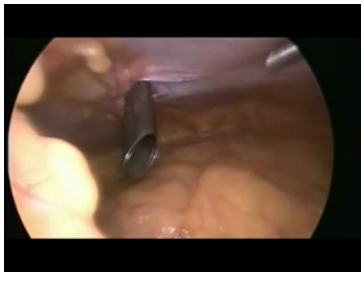
introduced to confirm its correct position *(figure 1)*



Then the trocar was connected to the insufflation tube. Any intra abdominal injury was further excluded after viewing the entry area from other port made under vision,

prior to proceeding for the intended procedure *(figure 2)*.

figure 2



DISCUSSION

BDTI was possible in all the patients. After umbilicus, the safest site is the palmer's point was chosen for primary entry (distended stomach and huge splenomegaly are excluded) even in obese patients because the area is rarely affected by adhesions(6). The pneumoperitonium time required upto IAP of 12mm of Hg was =/< 2 minutes from incision time and less than a minute from insufflation time. No patient sustained any form of trocar entry related injury. No patient had any metabolic changes related with 12L/minute flow rate of carbon dioxide from the beginning apart from the usual changes related with any pneumoperitonium.

The mean Laparoscopic time for BDTI and Verres technique pneumoperitonium is 2.2 minutes and 5.9 minutes respectively(2). The open technique takes 180+/-36 seconds in comparison to BDTI 55+/-13 seconds(6). The push force(average 12.7 pounds per square inches with trocar) required for introduction of the Verress/Trocar varies with its sharpness. Depends upon the type of trocar(least push force required with pyramidal type)(9), BMI of the patient, Parity of women. Minimum the push force, lesser the chance of trocar entry related injuries(10).

The advantages of BDTI over other techniques are:-

(A) : (a) there is only one blind step in BDTI, whereas in most practised technique, the Verres, there are three blind steps. (a) Initial blind verses insertion, (b) blind insufflation and (c) blind trocar insertion following pneumoperitonium.(3).

(B) : There was no incidence of pre peritoneal insufflation with subsequent subcutaneous emphysema, as the entry was checked before pneumoperitonium(2).

(C) : The total Operative time is less in BDTI in comparison to open technique and Verres insertion, Both open and Verres takes more time for same pneumoperitonium(2,7).

(D) : BDTI before pneumoperitonium helps holding the anterior abdominal wall comparatively easily to lift than after pneumo peritonium.

BDTI is a safe procedure as all the other accepted techniques. In experienced hands, major vascular or visceral injuries are very rare(9). According to the Cochrane review by Duffy et al, there is no difference in complication rates when using the open or closed laparoscopic entry technique(8). Entry technique should depend on Surgeon's choice and confidence and of course on its safety range.

CONCLUSIONS

All the established laparoscopic entry procedures carry some form of injury chances, though they are very rare in expert hands. The BDTI technique carries complications equal to or less than other established techniques. More BDTI should be tried so that a larger database is achieved to further establish its safety profile to add this in the regular armamentarium of laparoscopic entry techniques. This technique should be adopted more, discarding its apprehended injury chances because it definitely reduces the overall operative time.

However, few areas need to be further explored, like how frequently the sharpness of the trocar is to be maintained in relation to the degree of push force, whether cutting or radially spreading trocars have lesser chances of injury, though trocar related injuries are very rare(9).

There was no conflict of interest

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