EDITORIAL

Management of Large Bile Duct Stones

Whereas stones in the gallbladder (GB) may not yet interest endoscopic interventionists, those in the common bile duct (CBD) certainly do. Having said so, let us not forget that more than 90% of stones in the CBD originate in the GB. So much for the change in residence!

Endoscopic removal of CBD stones is presently the treatment of choice in patients with post cholecystectomy retained stones including those with T-tube in situ, in patients with suppurative cholangitis, in elderly patients with GB in situ having stones both in GB and CBD and in those with CBD stones but no stone in the GB. In young patients with stones in both the GB and the CBD, there is an increasing trend to do a preoperative endoscopic clearance of the CBD followed by laparoscopic cholecystectomy - the so called all endoscopic treatment.

Failure of this approach in 10% of cases is mainly due to presence of stones larger than 1.5 cm in size. Their large size precludes their safe passage through the papillary orifice even after adequate sized sphincterotomy. It has been shown that stone size correlates inversely with the CBD clearance rate. In this study, the clearance rate for stones larger than 1.5 cm in diameter was a dismal 12% and the median diameter of CBD stones which could not be removed was 1.8 cm.

To deal with these large stones in the bile duct, several newer endoscopic modalities have been developed. They include stone fragmentation and dissolution, and stenting of the CBD.

Endoscopic sphincterotomy remains the first step in all endoscopic procedures for removal of CBD stones. A long sphincterotomy for retrieval of larger stones is however fraught with unacceptably high complication rate; hence, the endoscopist must desist from overcutting the papilla.

Fragmentation of large stones ie lithotripsy has become the preferred treatment modality to overcome the disproportion in the sizes of the stones and the sphincterotomy. The various modes of lithotripsy of CBD stones include mechanical lithotripsy, electrohydraulic lithotripsy (EHL), laser lithotripsy and extracorporeal shock wave lithotripsy (ESWL). In EHL, electrohydraulic shock waves are generated by an electric spark across two opposing electrodes in an aqueous medium. These hydraulic shock waves can be applied to CBD stones with the help of electrodes placed inside the CBD. Use of a 'mother and baby' choledochoscope may facilitate breaking of stone by EHL under direct vision. A major limitation of this procedure is the risk of perforation of the CBD, EHL has not become a widely used modality because of associated risks and lack of cumulative experience. Pulsed dye laser has been used extensively for laser lithotripsy. This system delivers low pulse energy to break the stone and has the advantage of generating very little heat so that thermal injury to the CBD is avoided. Though this technique has proven efficacy in breaking the stones various factors like the high cost of the laser equipment, lack of ready availability of the equipment, need for a choledochoscope for delivery of laser under direct vision and need for technical expertise have made this procedure an unviable option for most centers.

Taking a cue from the treatment of renal stones, ESWL has also been utilized in the management of both gallbladder stones and CBD stones. Use of ESWL for CBD stones requires the placement of a nasobiliary tube for injection of contrast material into the CBD to allow visualization of the stone and hence targeting of shock waves. An alternative strategy involves engagement of the stone in a basket and then directing the shockwaves on it; this may be of particular help in those cases in whom the Dormia basket has got impacted during an attempt to retrieve the stone. The success rate of ESWL in fragmenting the CBD stone is much less than that for gallbladder stones. Because of the technical problems and comparatively lower success rate of ESWL, it is currently not a favoured technique for fragmenting large CBD stones.

Mechanical lithotripsy is the most widely used procedure for breaking large CBD stones. The mechanical lithotripsy device consists of a reinforced Dormia basket coupled with a metal sheath; when the stone is caught in the basket and the sheath is advanced over the latter, the stone gets crushed between the basket and the sheath. The initial model from Olympus (BML 10Q) consisted of a tough metal sheath over the basket which made the placement of this device into the CBD difficult. Subsequently, improved versions (BML 30 and 40Q) which have a teflon sheath over the basket have been introduced; introduction of these devices into the CBD is easier. Success rates for crushing of CBD stones with this method vary from 68%-94%. Success rates for
stones larger than 2.5 cm in diameter are lower than those for stones smaller than this. Patients may at times require more than one session for satisfactory fragmentation of stones. A nasobiliary drainage is necessary in between these sessions to diminish the risk of development of cholangitis. The complications associated with the use of mechanical lithotripter are mainly related to endoscopic sphincterotomy. Occasionally however, perforation of the CBD may occur during the insertion of the tough metal sheath; this was particularly the case with the use of the earlier version BML IQ. Another type of mechanical lithotripter in use is the Soehendra lithotripter. This is used when the Dormia basket gets impacted at the lower end of the CBD due to the large size of a stone. In such situations, the endoscope is removed, handle of the basket is cut and a metal sheath is inserted over the basket. The wires of the basket are attached to a wounding device, which on turning forces the sheath down the wire to the ampulla and pulls back the Dormia simultaneously thus compressing and crushing the stone. The main limitation of Soehendra lithotripter is that the basket has to be sacrificed and thus its use is indicated only when the basket gets impacted inadvertently. If Soehendra lithotripter is not available and impaction of the basket occurs, extension of sphincterotomy and cutting of the last remaining fibres of the sphincter using a needle knife papillotome which is passed down the biopsy channel along side the basket may be tried. We have used this method successfully in three such cases (unpublished observations).

Other options for treating large CBD stones include contact dissolution and CBD stenting leaving the stone unretrieved. Contact dissolution is done using various chemicals such as methyl-ter-butyl-ether (MTBE), mono-octanoin and EDTA by infusing through the nasobiliary tube. Of these, MTBE is the most commonly used agent, which dissolves cholesterol stones. It has however, fallen out of favour after the initial enthusiasm because of limited success and the potential of chemical injury to the CBD.

Stent placement in the CBD has been recommended as a definitive procedure in elderly patients who are poor surgical risk and those in whom the stone is too large to be fragmented and retrieved through sphincterotomy (Fig.). Long term results indicate that these patients do fairly well with the stent preventing the development of acute cholangitis.

Thus, the current procedure of choice for fragmentation of CBD stones is the use of mechanical lithotripsy in view of its wide availability, relatively simple technique, low incidence of complications and a high success rate. This has been reaffirmed by the Indian experience reported in this issue of the Journal. The authors of this article treated 22 patients with CBD stones too large to be extracted by Dormia basket. Mechanical lithotripsy was performed in all of them, utilising BML 2Q lithotripter in 14 patients and Soehendra lithotripter in 8 patients. The success rate was 91% which is as good as reported from any other center in the world. Although we know that the Dormia basket got impacted in eight patients necessitating the use of Soehendra lithotripter, we do not clearly know the total number of patients in whom Dormia basket retrieval was attempted. The complication rate of about 25% (including four cases of cholangitis) is rather high specially since the CBD had been cleared of stones and/or a nasobiliary drainage was provided in all patients. Nevertheless, this study does underscore the importance of mechanical lithotripsy in patients with large CBD stones.

However, other treatment modalities should be available and used in case of failure of mechanical lithotripsy. Lastly, a mature endoscopist must appreciate the limitations of each of these modes of therapy and send the occasional patient in whom all the available treatment modalities have failed so that surgery can be considered well in time.

Thus endoscopic methods have become the favoured treatment in the management of CBD stones including the large ones. The only unresolved issue in the management of CBD stones is regarding young patients with stones in the CBD as well as in the gallbladder. Only a large trial, possibly a multicenter one, can answer whether endoscopic removal of CBD stone either before or after cholecystectomy (open or laparoscopic) is safer than their removal through open cholecystectomy and choledocholithotomy.

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References
NEWS AND NOTICES

10th Asian Pacific Congress of Gastroenterology (APCGE) & 7th Asian Pacific Congress of Digestive Endoscopy (APCDE) will offer Young Investigator's award, which will be given at their annual meeting in Yokohama, Japan, September 19-26, 1996. The award carries a grant of 100,000 yen in cash and exemption from registration fee. Young investigators are involved in basic and clinical research in the fields of Gastroenterology and Digestive Endoscopy may apply to:
Prof P Raja Sambandam
Prof & Head, Department of Gastroenterology
Madras Medical College & Government General Hospital,
Madras 600 003.

Application should contain the following details:
1. Curriculum Vitae i) Age and date of birth (with proof), ii) Mailing address, telephone and fax no., iii) Qualifications year wise iv) National & international academic awards (mention criteria and nature of these awards), v) Experience in Gastroenterology or related fields, vi) Academic research affiliation (mention whether full time or part time; if part time, number of hours/week), vii) whether ordinary or life member of ISG, and viii) the applicant's own appraisal (not more than 250 words).
2. i) List of publications, and ii) six photocopies of each 5 best papers/published in the above mentioned fields in indexed medical journals and three passport size photographs.
3. List of papers presented by the candidate at ii) annual conferences of the ISG ii) other national or international conferences.
4. A 250-word abstract of an original unpublished basic or clinical research paper related to gastroenterology, coagulopathy, surgery of the alimentary tract, hepatology or endoscopy.
5. Academic background including degrees (earned) and major field of study (within 150 words).
6. List of work for which the applicant has had primary responsibility during the past four years (within 150 words).

Last date for submission is November 1, 1995.

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1. Abstracts must be in English.
2. Abstracts will be photographically reproduced for publication in abstract book. Care should be taken during preparation to avoid smudges, smudges and errors.
3. Abstracts should be typed in 12 pitch (letter to an inch) or equivalent, using black ink and single spacing in 18 cm x 15 cm box on white paper.
4. Title should be typed in bold capital letters except for words whose scientific meaning requires the use of lower case. Title should be concise but sufficiently detailed for the nature of study to be clearly identified.
5. In listing authors' names, the given names' initials should precede the family name. The name of presenting author should be underlined. Institutions name(s) and location(s) including city and country, should be followed directly after the authors' name.
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