

Reducing the incidence of incisional hernia after liver transplantation

doi:10.1111/j.1432-2277.2009.00992.x

Two important issues must be considered when deciding the abdominal incision for a liver transplant (LT): a good access to both liver lobes and a reduced rate of wound-related morbidity. Historically, two incisions have been recommended for a LT: the classic Mercedes incision [1] and the subcostal bilateral incision [2]. Nevertheless, in recent years, the right subcostal incision with medial extension to xyphoid process (J-shaped incision) has arisen as a good option for liver surgery [3]. The reported frequencies of incisional hernia after LT range from 4.9% to 17.2% and several factors such as older age, acute rejection with steroids treatment, ascites or wound infection seem to be associated [4–7]. In a recent article from UCLA, an incidence of 4.6% of incisional hernia was reported after LT through a Mercedes incision [4]. The authors found that reoperation, pulmonary complications and the male gender were associated risk factors for incisional hernia. Comparing the outcome using the J-shaped incision and the classic Mercedes incision for LT, Heisterkamp *et al.* [8] found a significantly lower incidence of incisional hernia after the J-shaped incision (7% vs. 24% $P = 0.002$) with a relaparotomy rate that was not significantly different between the two groups (31% and 45% respectively $P = 0.487$).

From January 1998 to December 2007, we performed 626 consecutive orthotopic liver transplantations. All patients were transplanted using a bilateral subcostal incision that was closed with two layers of running sutures of absorbable monofilament (Maxon I; Synature, Covidien, Mansfield, USA). Child-Pugh score was A in 141 patients (22.5%), B in 242 (38.7%), and C in 243 (38.8%). Immunosuppression was based on tacrolimus, and steroids from the first post-transplant day (20 mg/day of prednisone). A 3-day course of methylprednisolone was used in 83 patients (13.2%) to treat a moderate or severe acute cellular rejection. Post-transplant relaparotomy was needed in 29 patients (4.6%). No patient was lost to follow-up. An incisional hernia was diagnosed, and subsequently treated in 11 patients, which means an incidence of 1.7%. The Chi-squared test was used to compare our results with the two reports already mentioned [4,8]. Our incidence of incisional hernia was significantly lower with a P value

ranging from 0.03 to 0.003 depending on the type of incision, J-shaped or Mercedes. In our opinion, this significantly low incidence of incisional hernia may be explained by several circumstances: (i) the avoidance of Mercedes incision and its relative ischemic area at the trifurcation point, (ii) the low accumulated steroid dose in our patients because of our immunosuppressive protocol and the low rate of steroids-treated acute cellular rejection, and (iii) the significant low incidence of post-transplant relaparotomy ($P < 0.001$ when compared with the reports previously mentioned [4,8]). According to our results, subcostal bilateral incision may be considered for liver transplantation provided other risk factors for incisional hernia are prevented. Incisions with upward midline extension may be reserved for liver transplants with difficult suprahepatic vein reconstruction, as they allow a vertical access to the suprahepatic vena cava rather than from a caudal view [9].

Mikel Gastaca, Andrés Valdivieso, Patricia Ruiz and Jorge Ortiz de Urbina
*Hepato-biliary surgery and liver transplantation Unit,
 Hospital Universitario de Cruces-Bilbao, Baracaldo,
 Vizcaya, Spain*

Funding

No funding sources support this work. Authors have no commercial associations.

References

1. Klintmaln GB, Busuttil RW. The recipient hepatectomy and grafting. In: Busuttil RW, Klintmaln GB, eds. *Transplantation of the Liver*. Philadelphia, Pennsylvania: W.B. Saunders Company, 1996: 405–418.
2. Wood RP, Ozaki CF, Katz SM, Monsour HP. Operative procedures. In: Maddrey WC, Sorrell MF, eds. *Transplantation of the Liver*. Norwalk, Connecticut: Appleton & Lange, 1995: 61–87.
3. D'Angelica M, Maddineni S, Fong Y, *et al.* Optimal abdominal incision for partial hepatectomy: Increased late

- complications with Mercedes-type incisions compared to extended right subcostal incisions. *World J Surg* 2006; **30**: 410.
4. Vardanian AJ, Farmer DG, Ghobrial RM, Busuttil RW, Hiatt JR. Incisional hernia after liver transplantation. *J Am Coll Surg* 2006; **203**: 421.
 5. Gomez R, Hidalgo M, Marques E, *et al.* Incidence and predisposing factors for incisional hernia in patients with liver transplantation. *Hernia* 2001; **5**: 172.
 6. Shi LW, Verran D, Rao AR, Steward GJ, Mc Caughan GW. Incisional hernia following orthotopic liver transplantation. *Transplant Proc* 2003; **35**: 425.
 7. Piazzese E, Montalti R, Beltempo P, *et al.* Incidence, predisposing factors and results of surgical treatment of incisional hernia after liver transplantation. *Transplant Proc* 2004; **36**: 3097.
 8. Heiselkamp J, Marsman HA, Eker H, Metselaar HJ, Tilanus HW, Kazemier G. A J-shaped subcostal incision reduces the incidence of abdominal wall complications in liver transplantation. *Liver Transpl* 2008; **14**: 1655.
 9. Fan ST. Right liver graft. In: Fan ST, eds. *Living Donor Liver Transplantation*. China: Takungpao Publishing Co, Ltd, 2007: 53–74.