

Single-centre experience of paediatric intestinal and multivisceral transplantation during the COVID-19 pandemic—Lessons for the future

Dear Editors,

A successful outcome in paediatric intestinal (IT/MVTx) involves delivery of complex care pathways. The impact of COVID-19 pandemic is magnified in this setting due to factors such as restriction of resources and the risk of nosocomial SARS-CoV-2 infection. We performed 5 IT/MVTx (out of total 12 IT/MVTx performed across 4 UK centres) in the 2020 calendar year (Table 1). We adapted our service delivery and aim to highlight key messages which will influence our future practice, in this letter. Data sharing is not applicable to this article as no new data were created or analysed in this study.

Recipient and donor SARS-CoV-2 PCR testing, establishment of perioperative 'clean' pathways and the use of enhanced personnel protective equipment in theatre were as per local and national protocol.¹ There were no significant perioperative complications and no incidence of nosocomial COVID-19 in our recipient cohort. Two among the five children (hepatoblastoma involving the portal vein/superior mesenteric vein axis and another child with intractable stoma bleeding) required an appeal to the national regulatory body for prioritization of candidates for organ allocation due to rapid clinical deterioration.

A median recipient weight of 24 kg and clinical urgency necessitated innovative surgical decisions. Two recipients needed staged abdominal closure, and one had bench liver reduction in transplanted graft. The availability of senior surgeons at retrieval and clear communication with receiving centre kept the cold ischaemic time to a minimum.

The post-transplant protocol was modified as follows:

- Early discharge of the patient from hospital and a discharge planning meeting on a virtual platform with local clinician and

community nursing team, thereby involving them in local follow-up if there were any clinical concerns.

- Reduced frequency (normally one per week in the first 2 months after discharge) of face-to-face outpatient visits, stoma biopsies (substituted by virtual video clinic every 3 weeks) and routine endoscopies (three in the first 6 months to 1 in 6 months)
- Daily email update (from parents to lead clinician, dietician and specialist nurse) of fluid balance charts, weight, stoma output for early detection of an abnormal trend with email advice for adjustment of medication dosages, feeds, delivery of medications etc.
- Diagnosis and monitoring of (GVHD) via photographs sent on email.
- Hospital attendance for outpatient visit was only advised when there was a perceived need for intervention, that is stoma biopsy, review of rash.

None were affected by the altered follow-up regimen in the postoperative period. All children are alive at median 7-month follow-up. They were weaned off parenteral nutrition at discharge and have been established on enteral feeds/oral diet. One child has been established on an oral diet. Two children had GVHD, and one child had a single episode of mild rejection. The challenge was to engage parents and local medical teams in this new monitoring protocol, but was made possible by the use of a virtual platform and support from an extended multidisciplinary team.

The threat from newer COVID-19 variants and a further wave remains; however, the changes made in the delivery of intestine transplantation will last beyond the pandemic.

TABLE 1 Results—case series

| | 1 | 2 | 3 | 4 | 5 |
|---|---|--------------------------------|--------------------------|--|-------------------|
| Age | 2 years 4 months | 7 years 11 months | 3 years 8 months | 10 years 2 months | 10 years 2 months |
| Gender | M | F | M | F | M |
| Diagnosis | Hirschsprung's disease | Multi-focal Hepatoblastoma | Malrotation +Volvulus | Gastroschisis +Volvulus | Gastroschisis |
| Indication | Irreversible IF +Progressive IFALD +intractable stomal variceal bleed | SMV-PV axis tumour thrombus | Irreversible IF | Irreversible IF +Acute- on-chronic IFALD +intractable stomal variceal bleed | Irreversible IF |
| Graft type | MVTx | MVTx | IT (isolated SB) | Reduced liver +SB + Pancreas | MVTx |
| Time on transplant waitlist (days) | 23 | 29 (national appeal) | 185 | 89 (additional inpatient assessment and national appeal) | 264 |
| Recipient weight (kg) | 12.5 | 24.4 | 15 | 24.5 | 25.1 |
| Donor weight (kg) | 11 | 15 | 31 | 61 | 34 |
| Donor age | 1 year 4 months | 2 years 2 months | 8 years 3 months | 17 years 4 months | 7 years 10 months |
| Donor abdominal girth (cm) | | 49 | 58 | 67 | 61 |
| Donor BMI (kg/m ²) | 19.0 | 17.3 | 17.8 | 19.9 | 20.1 |
| Cold ischemia time | 4 h 42 minutes | 4 h 11 minutes | 3 h 36 minutes | 5 h 29 minutes | 5 h 13 minutes |
| Duration of ICU stay (days) | 23 | 2 | 3 | 17 | 2 |
| Duration of postoperative hospital stay (days) | 61 | 24 | 29 | 33 | 26 |

Note: MVTx, multivisceral transplant (graft including stomach, SB, pancreas and liver).

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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AUTHOR CONTRIBUTION

All authors confirm that they had full access to all the data in the study and accept responsibility to submit for publication.

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DATA AVAILABILITY STATEMENT

Not applicable.

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REFERENCE

1. COVID-19: advice for clinicians - ODT clinical - NHS blood and transplant [Internet]. <https://www.odt.nhs.uk/covid-19-advice-for-clinicians/>. Accessed May 23, 2021.