

The Covid-19 pandemic had limited impact on the management of inguinal hernia in infants under 6 months of age in the UK

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Inguinal hernia is one of the commonest surgical conditions in childhood, with an incidence of around 6% and up to 16% in pre-term and low birthweight infants (1-3). The Covid-19 pandemic disrupted hospital services but provided a unique opportunity to capture clinical outcomes for infants with inguinal hernia, who might have delays in operative management, including the possibility of spontaneous resolution while waiting for operative repair.

Twenty-five UK paediatric surgical centres participated in an observational study on the management of infants up to 6 months corrected gestational age (CGA) with inguinal hernia, from April to August 2020. The study was registered locally as a service evaluation.

950 patients were included, 834 (88%) male. The median gestation at birth was 35 [range 23-42] weeks. 184 patients were already on the waiting list for surgery on 1st April 2020.

626 (66%) infants underwent elective surgery during the study period. 119 (13%) had emergency surgery, presenting with an incarcerated hernia, of whom 42 (35%) were already on a waiting list. 21 (2.2%) were reported to have no evidence of hernia for over 4 weeks and therefore did not have surgery. There were no predictive factors for resolution of hernia including gender, gestation or age at presentation. 182 (19%) patients were still awaiting surgery at the end of the study.

Infants under 3 months CGA were more likely to require emergency surgery due to an incarcerated hernia (14% vs 8%, $p=0.02$, RR 1.1 (CI 1.04-1.2)). Conversely, infants over 3 months CGA were more likely to remain on the waiting list at the end of the data collection period: 31% compared to 16% of those under 3 months CGA, $p < 0.001$, RR 1.3 (CI 1.1-1.4). Median waiting time of infants undergoing elective surgery was 21 [0-284] days. In April 2020, national guidelines (4) advised that infants under 3 months of age should have surgery within 4 weeks, and infants over 3 months should have surgery within 12 weeks. Infants over 3 months CGA had a longer waiting time (81 [1-334] days) compared to infants under 3 months CGA (20 [0-210] days, $p < 0.0001$). Infants under 3 months CGA were more likely to have elective surgery within the guidelines: 358/587 (61%) were operated within 4 weeks of decision to operate (DTO), compared to 99/194 (51%) infants over 3 months CGA who were operated within 12 weeks of DTO, $p=0.02$, RR 1.1(CI 1.0-1.2) (Figure 1).

There were no delays reported due to SARS-CoV-2 infection. Delays due to system constraints secondary to the pandemic were reported in 282 (30%) infants. These infants waited longer for surgery: 67 [0-294] days compared to 12 [0-334] days for those not delayed, ($p < 0.0001$). There was no significant difference in complication rates between those who experienced delays and those who did not.

Despite concerns regarding the provision of surgical services across the NHS (5), for this group of patients, surgical management continued throughout. Despite the large cohort, only 21 patients did not have surgery because the hernia resolved – a smaller proportion than initially expected. With a median waiting time to surgery of 21 days, prompt surgery may have prevented the opportunity for spontaneous resolution. Likewise, a higher proportion of incarceration was expected secondary to system constraints during the pandemic, yet only 13% of patients required emergency surgery, similar to large studies before the pandemic (6). These data provide evidence that the Covid-19 pandemic has had

limited impact on the management of inguinal hernia, providing reassurance to surgeons and patients alike that paediatric surgical services have been resilient and functional throughout the pandemic.

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Figure legend:

Waiting time for infants over and under 3 months CGA with reducible hernia. Infants under 3 months CGA had a median waiting time of 20 days, which correlates to 61% being operated on within the guideline times. Infants over 3 months CGA had a median waiting time of 81 days, which correlates to 51% being operated on within the guideline times. The dashed red lines represent the FFSA guideline waiting time limits – 4 weeks for infants under 3 months of age, and 12 weeks for infants over 3 months of age.