Graphical user interface, website

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| Table 1: Descriptive data on study cohort | | |
|  | N | % |
| Primary surgery vs revision   * Primary * Revision   (628 ears) | 513  115 | 81.7%  18.3% |
| Laterality   * Left * Right   (628 ears) | 299  329 | 47.6%  52.4% |
| Unilateral vs Bilateral Surgery   * Unilateral * Bilateral   (516 surgeries) | 401  115 | 77.8%  22.2% |
| Cochlear abnormalities   * No abnormalities * Abnormalities   (628 ears) | 575  53 | 91.6%  8.4% |
| Surgeon Seniority   * Fellow * Consultant   (628 ears) | 174  454 | 27.7%  72.3% |
| Approach to cochlea   * Round window (RW) * Extended RW * Cochleostomy * Drillout   (626 ears)! | 574  21  22  9 | 91.7%  3.4%  3.5%  1.4% |
| Intraoperative assessment of electrode insertion   * Full insertion * Partial insertion   (626 ears)! | 608  18 | 97.1%  2.9% |
| Cerebrospinal fluid leak / endolymph gusher on entry to cochlea   * No Gusher * Gusher   (626 ears)! | 610  16 | 97.4%  2.6% |
| Packing at round window/cochleostomy   * Soft tissue (fascia/muscle) * Not mentioned/none   (626 ears)! | 376  250 | 60.1%  39.9% |
| Other measures to secure implant leads/receiver-stimulator   * Suture/Bone wax in mastoid cavity/facial recess * Well/bed or screws to secure implant package * Not mentioned/None   (626 ears)! | 10  16  600 | 1.6%  2.6%  95.8% |
| Intraoperative electrophysiological testing   * Testing * No testing performed   (628 ears) | 343  285 | 54.6%  45.4% |
| Implant electrode   * Implant A   + As (Straight)   + Ac (Precurved) * Implant B   + Bs (Straight)   + Bc (Precurved) * Implant C   + Cs1 (Straight)   + Cs2 (Straight) * Implant D   + Ds (Straight)   (628 ears) | 385  - 321  - 64  217  - 195  - 22  13  - 12  - 1  13  -13 | 61.3%  - 51.1%  - 10.2%  34.6%  - 31.1%  - 3.5%  2.1%  - 1.9%  - 0.2%  2.1% |
| Electrode type   * Precurved * Straight   (628 ears) | 88  540 | 14.0%  86.0% |

! 2 patients had missing operative notes

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| Table 2: Electrode Migration | | | | | | |
|  | | | | N | | % |
| Electrode migration (>=1) @ at post-operative X-ray | | | | 112 | | 18.0% |
| Electrode migration (2 or more) @ at post-operative X-ray | | | | 71 | | 11.5% |
| Delayed Migration(migration that occurs after post-operative X-ray) $ | | | | 5 | | 0.8% |
| Median time between first post-operative X-ray and imaging diagnosing delayed migration : 263 days (IQR=198) | | | | | | |
| Electrode migration stratified by number of electrodes(%) moving out of the cochlea after surgery at post-operative X-ray:@ | | | | | | |
| 0 electrodes | 1 electrode | 2 electrodes | 3 electrodes | | >=4 electrodes | |
| 508 (81.9%) | 41 (6.6%) | 37 (6.0%) | 19 (3.1%) | | 15 (2.4%) | |

@n= 620, 1 had insertion into the vestibular and 1 had insertion into the IAM, 6 poor quality X-ray at 2 weeks

$n=626, 1 had insertion into the vestibular and 1 had insertion into the IAM

| Table 3: Multivariate analysis of risk factors associated with electrode migration | | | | | | |
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|  | Migration of 2 or more electrodes at postoperative X-ray | | Unadjusted | | Adjusted  ( Pseudo R2: 0.065) | |
| Variable (risk factor ) | No (549) | Yes (71) | OR  (95% CI) | p-value | OR (95% CI) | p-value |
| Age in years at surgery  Median(IQR)  Adult >= 18 yo  Paediatric <18yo  Total (620)@ | 42  (IQR:62)  325 (88.8%)  224 (88.2%) | 39  (IQR:64)  41(11.2%)  30(11.8%) | (ref)  1.06 (0.64-1.75) | 0.815 | (not in model)  (ref)  1.01(0.51-2.01) | 0.969 |
| Laterality  Left  Right  Total (620)@ | 263 (89.5%)  286 (87.7%) | 31 (10.5%)  40 (12.3%) | (ref)  1.19 (0.72-1.95) | 0.500 | (ref)  1.24(0.74-2.10) | 0.416 |
| Gender  Female  Male  Total (620)@ | 296 (89.2%)  253 (87.9%) | 36 (10.8%)  35(12.1%) | (ref)  1.14 (0.69-1.87) | 0.610 | (ref)  1.17(0.69-2.00) | 0.556 |
| Primary vs Revision  Primary (ref)  Revision  Total (620)@ | 452 (89.3%)  97 (85.1%) | 54 (10.7%)  17 (14.9%) | (ref)  1.47 (0.82-2.64) | 0.201 | (ref)  1.30 (0.62-2.74) | 0.485 |
| Cochlear Abnormalities  No abnormalities (ref)  Fibrosis/ossification  Other Cochlear malformation  Total (620)@ | 508 (89.6%)  17 (73.9%)  24 (80.0%) | 59(10.4%)  6 (26.1%)  6 (20.0%) | (ref)  3.03(1.15-8.00)  2.15 (0.85-5.48) | **0.022**  0.108 | (not in model) |  |
| Cochlear Abnormalities  No abnormalities  Fibrosis and/or Cochlear malformations  Total (620)@ | 508 (89.6%)  41 (77.4%) | 59 (10.4%)  12 (22.6%) | (ref)  2.52  (1.25-5.06) | **0.009** | (ref)  3.40 (1.20-9.62) | **0.021** |
| Surgeon seniority  Consultant  Fellow  Total (620)@ | 402 (89.5%)  147 (86.0%) | 47 (10.5%)  24 (14.0%) | (ref)  1.49 (0.82-2.36) | 0.214 | (ref)  1.62(0.85-3.11) | 0.145 |
| Surgeon’s intraoperative assessment of insertion  Full insertion  Partial insertion  Total (618) $ | 535 (89.0%)  12 (70.6%) | 66 (11.0%)  5 (29.4%) | (ref)  3.37 (1.15-9.89) | **0.026** | ref  1.50  (0.43-5.22) | 0.525 |
| Entry into inner ear for electrode insertion  Round window  Cochleostomy  Drillout  Extended round window  Total (618) $ | 502 (88.4%)  20 (90.9%)  7 (77.8%)  18 (94.7%) | 66 (11.6%)  2 (9.1%)  2 (22.2%)  1 (5.3%) | (ref)  0.76 (0.17-3.33)  2.17 (0.44-10.68)  0.42 (0.06-3.22) | 0.716  0.339  0.406 | ref  0.70(0.15-3.35)  0.60 (0.08-4.36)  0.26 (0.03-2.25) | 0.659  0.613  0.221 |
| CSF/perilymph gusher on opening inner ear  No  Yes  Total (618) $ | 535 (88.7%)  12 (80.0%)  546 | 68 (11.3%)  3 (20.0%)  71 | ref  1.96 (0.54-715) | 0.304 | ref  1.17(0.23-6.02) | 0.848 |
| Electrode brand  A  B  C  D  Total (620)@ | 335 (87.5%)  193 (91.5%)  12 (92.3%)  9 (69.2%) | 48 (12.5%)  18 (8.5%)  1 (7.7%)  4 (30.8%) | (ref)  0.65 (0.37-1.15)  0.58 (0.74-4.58)  3.10 (0.92-10.46) | 0.140  0.606  0.068 | (not in model) |  |
| Electrode  Precurved  Straight  Total (620)@ | 75 (85.2%)  474 (89.1%) | 13 (14.8%)  58 (10.9%) | (ref)  0.71 (0.37-1.35) | 0.293 | (not in model) |  |
| Electrode  As  Bc  Bs  Cs1  Cs2  Ac  Ds  Total (620)@ | 280 (87.5%)  16 (76.2%)  176(93.12%)  1(100%)  11(91.7%)  56 (87.5%)  9(69.2%) | 40(12.5%)  5(23.8%)  13(6.9%)  0 (0%)  1(8.3%)  8 (12.5%)    4(30.8%) | (ref)  2.19 (0.76-6.29)  0.52 (0.27-0.99)  -  0.64 (0.08-5.06)  1.00 (0.44-2.24)  3.11 (0.92-10.57) | 0.147  **0.048**  -  0.669  0.100  0.069 | (ref)  1.14 (0.27-4.84)  0.46 (0.23-0.93)  -  0.62 (0.07-5.53)  0.86 (0.33-2.23)  1.11  (0.07-17.47) | 0.858  **0.034**  -  0.673  0.763  0.942 |
| Packing at RW / cochleostomy  Not mentioned/None  Soft tissue (fascia/muscle)  Total (618) $ | 217 (88.2%)  330 (88.7%) | 29 (11.8%)  42 (11.3%) | (ref)  0.95 (0.58-1.58) | 0.849 | (ref)  0.88 (0.51-1.53) | 0.658 |
| Other Methods to secure implant  Not mentioned/none  Suture or bone wax to secure electrode leads  Well, bed, suture of screws to secure package  Total (618) $ | 529 (89.4%)  7 (70%)  11 (68.8%) | 63 (10.6%)  3 (30.0%)  5 (31.2%) | (ref)  3.60 (0.91-14.3)  3.82 (1.28-11.3) | 0.068  **0.016** | (ref)  3.77 (0.91-15.70)  3.52  (0.29-42.18) | 0.068  0.320 |
| Intraoperative telemetry  No  Yes  Total (620)@ | 257 (90.5%)  292 (86.9%) | 27 (9.5%)  44 (13.1%) | (ref)  1.43 (0.86-2.38) | 0.164 | (ref)  1.08  (0.53-2.19) | 0.825 |
| @n= 620, 1 had insertion into the vestibular and 1 had insertion into the IAM, 6 poor quality X-ray at 2 weeks  $n=618, 1 had insertion into the vestibular and 1 had insertion into the IAM, 6 poor quality X-ray at 2 weeks, 2 had missing operative notes | | | | | | |

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| Table 4: Cases of delayed migration | | | | | | | |  |  |  |
| **Implant No.**  **Side** | **Age at surgery/ Gender** | **Cochlear abnormalities** | **Primary/Revision**  **Unilateral / Bilateral surgery**  **Electrode** | **Intraoperative findings** | **Cochlear entry** | **Methods to secure electrode** | **Telemetry** | **Electrode migration at post operative X-ray** | **Delayed migration** | **Head trauma** |
| 914  Right | 18/F | No | Primary  Bilateral Surgery  Electrode Bs | Full insertion bilaterally  No gusher noted | RW approach | Fascia placed at RW | Yes. | Full insertion at 12 days post surgery | 10 electrodes out at 263 days from first X-ray | Yes.  Hit right side of head. |
| 932  Left | 1/M | No | Primary  Bilateral surgery  Electrode As | Full insertion  No gusher noted | RW approach | Fascia placed at RW | Yes | 3 electrodes out at 14 days post surgery | 5 electrodes out at 220 days from first X-ray | Yes.  Hit left sided of head. |
| 331  Left | 48/F | No | Revision  Unilateral surgery  Previous explantation for pain  Electrode Ac | Full insertion  No gusher | RW approach | Muscle at RW | Yes | 3 electrodes out at 14 days post surgery | 5 electrodes out 87 days from first X-ray | No. |
| 444  Right | 32/F | No | Primary  Unilateral surgery  Electrode As | Full insertion  No gusher | RW approach | Fascia at RW | No | 2 electrodes out at 16 days post surgery | 4 electrodes out at 378 days from first X-ray | Yes. Knock on forehead |
| 688  Right | 31/F | No | Primary  Unilateral surgery  Electrode Bs | Full insertion  No gusher | RW approach | Fascia at RW | No | Full insertion at 11 days post surgery | 3 electrodes out at 138 days from first X-ray | No. |

Diagram

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