High Variability in Outcomes of Two-Stage Exchange to Treat Periprosthetic Joint Infection

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INTRODUCTION

Periprosthetic joint infection (PJI) is a challenging condition to manage with sobering morbidity and mortality. Treatment options range from simple irrigation and debridement with prosthetic retention to explantation and placement of a temporary cement spacer. Indications for each option are unclear and non-uniform despite significant efforts to understand the management outcomes. Until recently, a uniform definition of success was unavailable, thus clouding the discussion of treatment options. Two-stage exchange is currently considered the “gold-standard” in North America, yet an appropriate understanding of the actual success and ancillary effects of treatment is needed. With the advantage of an expert opinion defining success, this study was designed to understand the status of the current literature and the discussion of treatment options. Two-stage exchange is currently the most commonly implemented surgical protocol for treatment remains highly variable and generally unpredictable. As such, perhaps evidence is insufficient to suggest this modality is appropriately labeled as a “gold-standard.” Given the severe impact of PJI on the mortality and morbidity of arthroplasty patients, future endeavors involving well-controlled and defined investigations are imperative.

MATERIALS AND METHODS

All pertinent publications regarding outcomes of two-stage exchange involving more than 10 hip arthroplasties, from 1991 to 2012, were assembled and reviewed. Rates of infection eradication, non-infectious complications and demographic details were collected. Fifty-one published articles that included a total of 2,444 infected total hip arthroplasties treated with a two-stage protocol were included (Table 1). In addition to ascertaining the reported success rate, each article was reviewed for reporting of the components constituting successful PJI treatment as described by Diaz-Ledezma et al. These components include: (1) infection eradication, (2) no subsequent surgical intervention, and (3) no occurrence of PJI-related mortality.

RESULTS

The Delphi Method for PJI – Success Defined

- Infection eradication - characterized by a healed wound without fistula, drainage, or pain, and no infection recurrence caused by the same organism strain.
- No subsequent surgical intervention for (sepsis, necrotizing fasciitis).
- No occurrence of PJI-related mortality (by causes such as sepsis, necrotizing fasciitis).
- Retention of prosthesis is not the only defining factor of success.

TABLE 1

| Number of Articles Assessed | 51 |
| Date Published (Range) | 1991-2012 |
| Compiled data | Average (Range) |
| Reported Number of Patients per Article | 46 (8-202) |
| Age (Years) | 63 (49-72) |
| Males | 26 (4-109) |
| Females | 22 (2-95) |
| Number of Patients that Received Reimplantation | 45 (8-186) |
| Average Follow-Up (Months) | 57 (20.4-168) |
| Minimum Follow-Up (Months) | 26 (2-12) |
| Maximum Follow-Up (Months) | 102 (36-203.5) |

All statistical analyses were performed using SPSS. A p-value < 0.05 was considered statistically significant.

DISCUSSION

Despite advances in the diagnosis and management of PJI, the outcome of the most commonly implemented surgical protocol for treatment remains highly variable and generally unpredictable. As such, perhaps evidence is insufficient to suggest this modality is appropriately labeled as a “gold-standard.” Given the severe impact of PJI on the mortality and morbidity of arthroplasty patients, future endeavors involving well-controlled and defined investigations are imperative.

REFERENCES